

# The Mining Journal

## RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2183.—VOL. XLVII.

LONDON, SATURDAY, JUNE 23. 1877.

[WITH SUPPLEMENT. PRICE SIXPENCE. PER ANNUM, BY POST, £1 4s.]

**MR. JAMES H. CROFTS, STOCK AND SHARE BROKER,**  
AND MINING SHARE DEALER,  
No. 1, FINCH LANE, CORNHILL, LONDON, E.C.  
ESTABLISHED 1842.

BUSINESS transacted in a descriptions of MINING Stocks and Shares (British and Foreign), Consols, Bonds (Foreign and Colonial), Railways, Miscellaneous, Insurance, Assurance, Telegraph, Shipping, Canal, Gas Water, and Dock Shares.

BUSINESS negotiated in Stocks and Shares not having a general market value. BUSINESS in COLLIERIES and IRON Shares, and in the principal WAGON and MANUFACTURING COMPANIES OF THE NORTH OF ENGLAND AND SCOTLAND.

BUSINESS in all the principal COTTON SPINNING SHARES.

MR. J. H. CROFTS, having now established CORRESPONDING AGENCIES in all the Chief Towns of the United Kingdom, is prepared to deal in the various LOCAL Stocks and Shares at close market prices.

Accounts opened for the Fortnightly Settlement.

A Daily Price List, issued at 5 P.M., giving latest Quotations up to close of Market—4.30 P.M. Also, on the 1st of every month a List of all Securities currently dealt in upon the Mining and Stock Exchanges, with latest prices, current dividends, rate of interest yielded at market price, &c.

MINES INSPECTED.

Bankers: City Bank, London; South Cornwall Bank, St. Austell.

**SPECIAL DEALINGS** in the following, or part:—

15 Argentine, £4½.	10 East Van, £5½.	50 North Lacey, 21s.
20 Asheton, 26s.	25 Eberhardt, £17½.	20 Pateley Bridge, £2 13
20 Aberdaunt, 13s. 6d.	25 Flagstaff, £2 11s. 3d.	30 Pestarena, 3s. 9d.
25 Bampfylde.	20 Glenroy, 22s. 6d.	30 Parys Mountain, 9s. 3
25 Chichester, 19s.	10 Great Lacey, £21.	50 Penrith, 9s. 9d.
25 Chicago, £2 17s. 6d.	20 Glyn, 20s.	31 Penrith, 5s.
25 Chapel House, £23½.	20 Holmhouse, £1 12s.	10 Roman Gravel, £10½
25 Charentais (off. wd.).	50 Javali, 9s.	35 Rookhope, 21s.
10 Chontales, 8s. 9d.	50 Llanyrwst, £27½.	20 Richmond, £6 4.
15 Cakemore, £2½.	10 Llanyrwst (offer wanted)	10 St. Harmon, £27½.
25 Combarn, 7s. 6d.	10 Leadhills, £17½.	5 Tankerville, £7½.
20 Cordes of Chili, £23½.	20 Marke Valley, 23s. 9d.	25 Van Consois, 22s. 6d.
20 Cardiff & Swansea, 35s.	20 Mynydd Goreddu.	40 W. Tankerville, 20s. 6d.
50 Exchequer, 7s. 6d.	25 New Quebrada, £27½.	10 W. Wye Valley, £3½.

BUSINESS also on hand in: Bodidris, Belstone, Cesena Sulphur, Cedar Creek, Cargill, Denbighshire, East Craven Moor, D'Eresby, Gorseid and Merilyn, Grogwin, Lisburne, Last Chance, Minera, Medlyn Moor, New Zealand Kapanga, Oakham Collieries, Pennant, Pandora, Port Phillip, Plynlimmon, Santa Barbara, South Aurora, St. Harmon, Tecoma, Wheat Newton.

\* Shares sold for forward delivery (one, two, or three months) on deposit of 20 per cent.

**FOREIGN BONDS—ARGENTINE—EGYPTIAN—RUSSIAN,**  
TURKISH, SPANISH, PERU,  
RAILWAYS—HOME AND FOREIGN.

SPECIAL BUSINESS in the above, and Fortnightly Accounts opened on receipt of the usual cover.

\* THE WAR.—The latest Telegrams from the SEAT OF WAR are received throughout the day, and also the course of the Markets from EVERY CONTINENTAL ROUTE.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

**AQUARIUM, HOTEL, INSURANCE, AND MISCELLANEOUS**  
SHARES.

SPECIAL BUSINESS in Brighton Aquarium, Royal Westminster Aquarium, Yarmouth Aquarium, Crystal Palace Aquarium, Milner's Safe, Telegraph Construction, Royal Insurance, Positive Assurance, Credit Foncier, and others.

\* BUSINESS TRANSACTED in all MISCELLANEOUS SHARES (of whatever description) having LONDON or COUNTRY MARKET VALUES.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

**BRITISH LEAD SHARES.—BUSINESS** in all leading Market  
Mines and Latest Special Information from the various districts.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

**COTTON SPINNING SHARES.—BUSINESS** in all OLDHAM  
SHARES, and in those of other DISTRICTS.

\* SPECIAL BUSINESS in the following SELECTED SHARES:—

Name of Mill.	Last four dividends, per cent.	Closing quotations, June 22.	Buyers.	Sellers.
Central	25, 30, 10, 10	2½	2½	2½
Greenacres	25, 30, 10, 10	2½	2½	2½
Green Lane	25, 30, 10, 10	2½	2½	2½
Oldham Twist	25, 30, 10, 10	2½	2½	2½
Royston	25, 30, 10, 10	2½	2½	2½
Shaw	25, 30, 10, 10	2½	2½	2½
Star	25, 30, 10, 10	2½	2½	2½
Windsor	25, 30, 10, 10	2½	2½	2½

NOTE.—The shares of good Cotton Spinning Companies pay remunerative dividends, the mills being almost entirely conducted on the Co-operative System, under the Limited Liability Acts. With a revival in trade the present rate of dividends would be augmented.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

Bankers: City Bank, London; South Cornwall Bank, St. Austell.

**MR. WILLIAM H. BUMPUS, STOCK AND SHARE BROKER,**  
44, THREADNEEDLE STREET, LONDON, E.C.  
[Established 1867.]

SPECIAL BUSINESS, at close prices, in the SHARES of all the principal HOME and FOREIGN MINES.

Shareholders, intending investors, and others who may be desirous of obtaining information and advice as to operations at the present time are requested to communicate.

**FOR SALE, at prices annexed:—**

100 Almada, 5s.	10 Frontino.	60 Parys Mount, 9s. 6d.
20 Argentine.	15 Flagstaff, £27½.	10 Roman Grav., £10½.
20 Aberdaunt, 13s. 6d.	25 Glenroy, 22s. 6d.	25 Richmond, £25½.
25 Asheton.	20 Glyn, 19s. 6d.	70 Rookhope, 22s.
80 Birdseye Creek, 1s.	10 Hultafall.	50 San Pedro, 14s. 6d.
2 Blue Tent.	70 I. L. L. 11s.	20 Sierra Buttes, £27½.
2 Carn Brea, £32½.	40 Javali, 8s. 6d.	25 South Aurora, 4s. 6d.
20 Cordes of Chili.	30 Kapanga, £3 13s. 9d.	15 Tankerville, £7½.
100 Chontales, 8s.	20 Leadhills, £17½.	30 United Mexican, 38s.
15 Don Pedro, 9s. 6d.	20 Marke Valley, 23s.	5 Van, £24½.
25 East Lovell, 25s.	40 North Lacey, 22s.	25 Van Consois, 19s. 6d.
5 East Van, £3½.	100 Pestarena, 4s. 6d.	20 West Asheton, 13s. 6d.
20 Eberhardt, £17½.	25 Pennerley, 7s.	40 Wheat Grenville.
100 Exchequer, 8s.	15 Pateley Bridge, 38s.	25 West Tankerville, 21s.

WILLIAM HENRY BUMPUS, SWORN BROKER.

Office: 44, Threadneedle Street, London, E.C.

Business transacted in Stock Exchange Securities and Miscellaneous shares of every description. Fortnightly accounts opened. References given and required when necessary. A Stock and Share List forwarded free on application.

BANKERS—THE NATIONAL PROVINCIAL BANK OF ENGLAND, E.C.

IMPORTANT.

THE HULTAFALL MINING COMPANY (LIMITED).

Full particulars of this valuable property, with copy of Report on same by Capt. R. Foulthry, of West Chiverton Mine, may be obtained on application to Mr. W. H. Bumpus, who has Special Business in the Shares.

All who have money to invest should secure an interest in this company at once. The shares are certain to have a great rise.

44, Threadneedle-street, London, E.C.

**MR. GEORGE BUDGE, STOCK AND SHARE DEALER,**  
4, ROYAL EXCHANGE BUILDINGS, LONDON, E.C. (Established 28 years), has SPECIAL BUSINESS in—Mynydd Goreddu, Minera, Glenroy, Tankerville, Grogwin, Denbighshire, Derwent, Tollima, Llanyrwst, Chapel House, Combarn, East Van, Cakemore Colliery, Bodidris, Hornachos, Talybont, Pennant, Yorke Peninsula, D'Eresby, Holmhouse, Cathedral, Trebeigh Consols, Mellanear, Richmond, Penrith, Cordes of Chili, Cesena Sulphur, St. John del Rey, Santa Barbara, Marke Valley, Cambrian, North Cornwall, Argentine, Blue Tent, Belstone, Prince of Wales, Clementina, Wheat Newton.

FOR SALE, 50 Brighton Livery Stables, at £4 6s. net.

**MESSRS. PETER WATSON AND CO.,**  
54, OLD BROAD STREET, LONDON, E.C.

BUSINESS IN STOCKS AND SHARES.

RAILWAYS, BANKS, DIVIDEND LEAD MINES, &c.

BANKERS: THE ALLIANCE BANK (LIMITED).

A CIRCULAR published MONTHLY. Single Copy, 6d.; Annually, 5s.

**MR. ALFRED E. COOKE,**  
STOCK AND SHARE DEALER,  
78, OLD BROAD STREET, LONDON, E.C.

ESTABLISHED 1853.

Business transacted at NET PRICES in CONSOLS, ENGLISH RAILWAYS, BANKS, FOREIGN STOCKS, TELEGRAPHS, & MISCELLANEOUS SHARES.

SPECULATIVE ACCOUNTS opened on receipt of cover in RAILWAYS and FOREIGN STOCKS.

PURCHASERS OF MINING SHARES should apply to Mr. COOKE, who can always supply at LOWEST PRICE NET.

CLOSING PRICES OF RAILWAYS, FOREIGN STOCKS, and MINES, corrected to 5.45 P.M., ready DAILY.

NO MORE COPIES OF THE JUNE "SPECIAL INVESTMENT CIRCULAR" can be had, as the issue is EXHAUSTED.

IMPORTANT NOTICE TO CLIENTS AND INVESTORS.—

Every Friday evening will be published, in time for Evening Post, a WEEKLY EDITION OF

THE INVESTOR'S GAZETTE.

Containing latest prices and advices from Mines, with other valuable intelligence for investors.

Terms of subscription—12 months, 10s.; 6 months, 5s.; 3 months, 2s. 6d.

THE INVESTOR'S GAZETTE.—The Second Number of the New Series was published last evening. Every reader of the Mining Journal should subscribe.

ALFRED E. COOKE, 78, OLD BROAD STREET, LONDON.

ESTABLISHED 1853.

**MR. JAMES STOCKER, STOCK AND SHARE BROKER,**  
AND MINING SHARE DEALER,  
2, CROWN COURT, THREADNEEDLE STREET, LONDON, E.C.

[Established 1848.]

BUSINESS transacted in all kinds of STOCK EXCHANGE SECURITIES, also in every description of BRITISH and FOREIGN MINING, COLLIERIES, MANUFACTURING, and other SHARES.

SPECIAL BUSINESS in the following:—

Aberdaunt, 13s. 6d.	Glenroy, 21s. 6d.	Penrith, 9s. 6d.
Asheton, 26s.	Flagstaff, 21s.	Pandora, 22s. 6d.
Bampfylde.	Holmhouse, 31s. 9d.	Parys Mountain, 9s. 6d.
Bodidris.	Leadhills, £17½.	Rookhope, 21s.
Combarn.	Ladywell, 18s. 9d.	Roman Grav., £10½.
Combarn, 7s. 6d.	Llanyrwst, £2 18s. 9d.	So. Roman Gravel, 8s. 6
Derwent, £2½.	Marke Valley, £17½.	Tankerville, £7½.
Devon Consols, £4½.	Mynydd Goreddu.	Van Consois, 20s.
East Van, £3½.	North Lacey, 21s.	West Asheton, 17s. 6d.
Grogwin, £27½.	Pateley Bridge, £2.	West Tankerville, 20s.
Great Lacey, £27½.	Pennerley, 4s. 6d.	West Chiverton, £16½.
Argentine, £4½.	Exchequer, 7s. 6d.	New Quebrada, 38s.
Cardiff, 10s.	Flagstaff, 21s.	Port Phillip, 10s.
Cordes of Chili, 58s. 6d.	Frontino, £27½.	Richmond, £6½.
Chicago, 48s.	I. L. L. 8s. 6d.	San Pedro, 16s. 3d.
Chontales, 8s. 6d.	Javali, 7s. 9d.	South Aurora, 4s. 6d.
Don Pedro, 9s. 6d.	Last Chance, 8s.	Tecoma, 7s. 6d.
Eberhardt, £17 6s. 3d.	N. Zealand Kap., £27½.	United Mexican, 41s.

JAMES STOCKER, SWORN BROKER.

Consols, Foreign Bonds, Railways, Bank, Telegraph, Gas, and all miscellaneous Shares bought and sold, and fortnightly accounts opened for same. Shares sold for forward delivery on receipt of cover. List of prices and every information forwarded on application. References given and required when necessary.

BANKERS: LONDON AND WESTMINSTER.

**JOSEPH JOHN PYNE,**  
MINING BROKER  
AND  
STOCK AND SHARE DEALER,  
6, BISHOPSGATE STREET LONDON, E.C.

Mr. PYNE having been connected with MINING ENTERPRISE for upwards of FOURTEEN YEARS, and having been a DIRECTOR OF MINES in SHROPSHIRE, MONTGOMERYSHIRE, CARDIGANSHIRE, CARNARVONSHIRE, YORKSHIRE, and in VENEZUELA, has had great opportunities of becoming acquainted with this particular branch of industry, and will always be desirous of giving every information in his power to all investors transacting business with him.

ALL DESCRIPTIONS OF SHARES are dealt in, including BRITISH and FOREIGN STOCKS, and RAILWAY SECURITIES.

BANKERS—THE ALLIANCE BANK (LIMITED).

**MR. T. E. W. THOMAS, SHARE BROKER,**  
3, GREAT WINCHESTER STREET BUILDINGS, E.C.

ESTABLISHED 1857.

The following are the latest prices at which business could be done. Where the difference between the buying and selling price is wide transactions may be effected at an intermediate price:—

Buyers.	Sellers.	Buyers.	Sellers.
Argentine	£4 4½	North Lacey	20s. 22s.
Asheton	1 1½	New Quebrada	£13½
Bodidris	1 1½	New Zealand Kapanga	1½
Derwent	2½	Parys Mountain	9s. 11s.
Devon Great Consols	3½	Pateley Bridge	1½
Dolcoath	30	Pennerley	2s. 6½
Don Pedro	8s. 10s.	Penrith	9s. 10s.
Eberhardt	7 7½	Richmond	6½
East Caradon	3½	Roman Gravel	10 10½
East Van	6 5½	Rookhope	20s. 22s.
Exchequer Gold	6s. 3d. 8s. 9d.	San Pedro	7s. 6d. 10s.
Flagstaff	2½	South Condurrow	7½
Glenroy	1 7½	Tankerville	14 16
Glyn	7 1½	Tinroft	14 16
Great Lacey	20 21	Van	34 36
Javali	7s. 9s.	Van Consois	3½ 1
Last Chance	5s. 10s.	West Asheton	3½ 7
Ladywell	1 1½	West Chiverton	15 16
Leadhills	6 6½	West Tankerville	1 1½
Marke Valley	1 1½	W. Grenville (call pd.)	1½ 1½

SPECIAL BUSINESS in Aberdaunt, Llanyrwst, Rookhope, North Lacey, and Gorseid and Merilyn. The latter mine is now extraordinarily rich in lead ore. The sales, already 50 tons per month, are about to be materially increased. Holders will have immediate and good dividends.

**MESSRS. ENDEAN AND CO., STOCK AND SHARE**  
DEALERS, 85, GRACECHURCH STREET, LONDON, E.C.

**MESSRS. JOSEPH J. REYNOLDS AND CO.,**  
28, FINSBURY PLACE, E.C., have SPECIAL BUSINESS in—

Great Lacey, Pennant, Combarn, Bodidris, Mynydd Goreddu, Perkins Beach, St. Patrick, Cordes of Chili, Albion Iron Company, Denbighshire Consols, Llanyrwst.

**MR. W. MARLBOROUGH, STOCK AND SHARE DEALER**  
29, BISHOPSGATE STREET, LONDON, E.C. (Established 20 years), can sell the following SHARES, at prices annexed:—

10 Altamir.	25 Gorseid & Merilyn.	30 Nth. Lacey, 21s. 6d.
15 Argentine, £4 5s.	50 Glyn, 21s.	50 Pennant, £3½.
60 Bodidris, £1 2s. 6d.	50 Gold Run, 8s. 3d.	50 Penrith, 9s. 6d.
5 Colorado Ter., £1½.	100 Great W. Van, 4s. 6d.	100 Port Phillip, 10s. 3d.
5 Cargoli, £4½.	15 Great Dylliffe, £3½.	90 Parys Mount, 10s.
50 Chicago, £2½.	25 Glenroy, 22s.	40 Rookhope, 21s.
25 Cakemore, £2½.	60 I. L. L., 8s. 6d.	10 Roman Grav., £10 13
75 Chontales, 8s. 9d.	20 Leadhills, £17½.	10 Richmond, £6½.
30 Exchequer, 7s. 9d.	70 Malabar, 4s. 9d.	25 Russia Copper, 38s. 9d
25 East Caradon, 14s. 9d.	6 Malpas, £3½.	40 Tankerville, £7 11s. 3d
20 Frontino, £27½.	5 Minera, £19½.	40 Van Consois, £7.
40 Flagstaff, £2 11s. 3d.	20 New Zealand, £2.	10 West Goginan, 8s. 9d.

Shares Bought and Sold at net prices. Telegrams promptly attended to.

**MR. CHARLES THOMAS,**  
MINING AGENT, STOCK AND SHARE DEALER,  
3, GREAT ST. HELEN'S, LONDON, E.C.

**MESSRS. A. W. THOMAS AND CO.,**  
10, COLEMAN STREET, E.C.

MINING AGENTS, AND STOCK AND SHARE DEALERS.

BUYERS of Miners and Lisburne.

"INVESTMENTS AND SPECULATIONS FOR 1877."

Price Sixpence.

TO CAPITALISTS, SHAREHOLDERS, INVESTORS, TRUSTEES.

**DIVIDENDS 4 TO 7 AND 10 PER CENT.**

The safest, most trustworthy, and valuable publication of the day is

**SHARP'S STOCK AND SHARE INVESTMENT CIRCULAR,**

Published monthly. Read the JUNE EDITION (12 pages), post free.

It contains Safe Investments in English and Foreign Railways, Preference and Debenture Stocks, Telegraph, W. Gas, Dock, Tramway, Insurance, Bank, Mine, and Miscellaneous Shares, also Dividends; Foreign Loans, Bonds, &c.; Indian, American, and Colonial Stocks, &c.; Market Prices, Reports, &c.

The above Investment Circular is a Safe Guide to Investors.

**GOULD SHARP AND CO., STOCK AND SHARE BROKERS,**  
MINING SHARE DEALERS, 42, POULTRY, LONDON, E.C.

Established 1852.—Bankers: London and Westminster, Lothbury, E.C.

**MR. EDWARD ASHMEAD, 62, CORNHILL, LONDON**  
LONDON MINE AGENT, ACCOUNTANT, AND AUDITOR.

Constantly connected with Mining since 1856. Information given on Mining Properties as an Investment. Purchases and Sales of Mining Shares effected. Statistical Table of the Dividend Mines of 1876, and of the Highest and Lowest prices of Mining Shares. Post free, price Sixpence.

**FERDINAND R. KIRK, STOCKBROKER,**  
5, BIRCHIN LANE, E.C.

SHARES WANTED:—

60 Glenroy. 150 North Lacey. 80 Rookhope.

40 Chapel House. 75 Parys Mountain. 50 Plynlimmon.

BUSINESS IN:—

30 Roman Gravel, £10½. 100 Exchequer, 8s.

100 Don Pedro, 9s. 6d. 40 Pateley Bridge, £23½.

30 W. Tankerville, £17½. 80 Bampfylde.

20 East Van, £3. 40 Leadhills, £17½.

20 Exchequer, 7s. 6d. 60 I. L. L., 8s.

Cheques should be crossed London and Westminster.

**MR. E. J. BARTLETT, STOCK AND SHARE DEALER.**

No. 30, GREAT ST. HELEN'S, LONDON, E.C., has SPECIAL BUSINESS in the following:—175 Bodidris, 20 East Van, 90 Gorseid and Merilyn, 20 Great Lacey, 500 Parys Mountain, 75 Penrith, 15 Richmond, 2 South Condurrow, 100 West Godolphin, 10 West Craven Moor, and 55 Wheat Grenville.

In the Press. The Latest Edition of

"HOW AND WHEN TO INVEST."—

(Post free. One Shilling.)

By E. J. BARTLETT, of No. 30, GREAT ST. HELEN'S, LONDON, E.C.

They have availed themselves of the information contained in the last edition of this carefully compiled work may be congratulated upon the result of their investments.

The Stocks recommended were:—Direct Cable, at £7½; Gorseid and Merilyn, £2½; Great Eastern, £42; South Condurrow, £5½; Minera, £10—and a glance at the present quotations will show the advance which has since taken place in their values.

**MESSRS. W. J. TALLENTIRE AND CO.,**  
STOCK BROKERS, AND DEALERS IN BANK, TRAMWAY,  
MINING, AND MISCELLANEOUS SHARES.

20, CHANGE ALLEY, CORNHILL, LONDON, E.C.

Transact business in Stock Exchange Securities and Mining Shares of every description, either for immediate cash or the usual bi-monthly settlements, and also afford advice personally or by letter to executors, trustees, capitalists, and investors of every class in the selection of Securities for safe and profitable investment, their experience of the markets, extending over a period of more than 17 years, together with special facilities for acquiring information, enabling them to act beneficially for clients.

They have established Corresponding Agencies in all the principal towns of the United Kingdom, and are prepared to deal in the various local Stocks and Shares at close prices. Orders per post or telegraph receive prompt attention.

INVESTORS SHOULD APPLY for a copy of Messrs. W. J. TALLENTIRE and Co.'s Circular, SENT POST FREE. It contains valuable information on Foreign Stock, Railway, Mining, and General Investments.

TO INTENDING INVESTORS AND SHAREHOLDERS.

**MESSRS. W. J. TALLENTIRE AND CO., 20, CHANGE ALLEY,**  
CORNHILL, LONDON, E.C., have the following MINING SHARES

FOR SALE.

OFFERS CAN BE MADE, OR PRICES WILL BE FORWARDED:—

100 ABERDAUNT..... LEAD. 350 PERKIN'S BEACH..... LEAD.

200 BODIDRIS..... do 100 PENNERLEY..... do

40 EAST CRAVEN MOOR..... do 50 PAN DORA..... do

35 EAST VAN..... do 100 ROOKHOPE..... do

500 ELGAR..... do 25 ROMAN GRAVELS..... do</



## CHEAP CHEMICAL APPARATUS.

Now ready.

## SECOND EDITION OF GRIFFIN'S CATALOGUE,

ENTIRELY REVISED, AND SHORTLY TO BE PUBLISHED AT GREATLY REDUCED PRICES.

Being the largest, most complete, and cheapest List of Apparatus ever placed before the public.

## CHEMICAL HANDICRAFT,

A Classified and Descriptive Catalogue of CHEMICAL APPARATUS, with copious Explanatory Notes. By JOHN J. GRIFFIN, F.C. In demy 8vo. 472 pages, illustrated by 1600 woodcuts. Price 4s., bound in cloth. Postage, 7d.

Published by JOHN GRIFFIN AND SONS, Chemical and Philosophical Instrument Makers,  
22, GARRICK STREET, COVENT GARDEN, W.C.

## Lectures on Practical Mining in Germany.

## CLAUSTHAL MINING SCHOOL NOTES—No. XXX.\*

BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.,  
Certificated Mining Engineer.

(Formerly Student at the Royal Bergakademie, Clausthal).

[The Author reserves the right of reproduction.]

## SECTION II.

## PROSPECTING FOR MINERALS—BORING.

## III.—THE BORING OPERATION.

## REMOVAL OF HINDRANCES WHICH OCCUR OR ORIGINATE DURING THE BORING.

As this method of boring with the simultaneous insertion of the lining cannot always be carried on successfully from beginning to end, it is most advisable to commence the bore hole of a large diameter, and carry it down as far as it is likely that the lining will readily follow, and then to continue the bore hole again of a smaller diameter, and carry it down as far as it is likely the second lining (which will reach through the first lining to the surface) will readily follow.

When a bore hole has served its purpose, and is about to be abandoned, if it has been lined it may be worth while to extract the lining, which if it fits very tightly in the bore hole must be cut. This cutting of a lining may also be necessary in ordinary boring operations, when owing to pressure on the outside, or the application of too great a force in inserting the lining, the latter has been bulged in, and the lining fits too tightly to be withdrawn in one set, the withdrawal being necessary to change the damaged portion. Such a necessity is, fortunately, very rare in boring operations.

The cutting of the lining in a bore hole takes place occasionally both in a horizontal and vertical direction; it is evident that the boring rods will be more severely tested in the former case.

For cutting the lining in a bore hole in a horizontal direction, M. Dégoussée has frequently used the enlarging borer, provided with suitable cutters, which we have mentioned previously as designed by him for enlarging a bore hole beneath the lining. In this case the cylinder has a tapered hole on its under surface, into which a set of rods are screwed, which reach to the bottom of the bore hole, so that in case the rods above break, owing to the great force of the torsion exerted, the apparatus is prevented from falling to the bottom of the bore hole, when a set of rods with left-handed screws might be necessary to enable the rods to be twisted sufficiently quick to cause the cutters to fly back into their seats, so as to allow of the apparatus being raised.

M. Dégoussée has also devised two other somewhat more complicated instruments for cutting bore hole linings horizontally. The first of these which we shall describe consists of a very strong iron rod, the upper end forming a screw, by which it is attached to the shaft rods; the lower end forms a sort of flat piston, about  $\frac{3}{4}$  in. less in diameter than the lining. On to the under side of this piston two nearly semicircular plates are bolted; to one of these plates a long stiff rod is attached, the lower end having a tapered hole, into which the supporting rods are screwed. The other plate has a slot in it, sufficiently large to allow of the cutter working in it. The cutter is centred on a bolt passing through the piston and plate; the end of the cutter opposite the cutting edge is formed as a curved tail. Against the side of this tail a stiff and powerful spring presses, the lower end of this flat spring being bolted to the rod (attached to the other plate) just above where it is swelled to be tapped to receive the lower rods. The flat spring pressed the tail of the cutter in such a direction that the cutting edge is forced tightly against the lining.

The second instrument is designed so as to be suitable for boring holes of different dimensions. It consists essentially of two arms, hinged at their lower ends, and carrying at their upper ends two separate halves of a circular blade, or saw, and of a wedge, by means of which the two semicircular halves of the saw are forced apart against the sides of the lining. The wedge consists of two long flat pieces of iron, about  $\frac{1}{2}$  in. thick, and tapering from 7 in. in breadth at the upper to 2 in. in breadth at the lower end. These plates are welded to a cross piece (2 in. thick and  $\frac{1}{2}$  in. high) at their lower ends, and at the upper end to a strong shaft, which has a screw at its upper end, by which the apparatus is attached to the shaft rods. These two flat plates are thus held about 5 in. apart. On the broad outside of each of these plates two grooves are cut near to and parallel to the tapering edges. The two semicircular saw blades are each bolted between two massive plates, or blocks, and above and beneath and bolted to these plates are four other guide plates, cut to a smaller radius than the saw blades. Each of these four guide plates is in the shape of a sector of a circle, the angular corners being prolonged and bent (or slotted) to this shape from a larger plate round in the form of a square hook, so as to fit the grooves cut in the flat wedge plates. The guide plates thus slide on the inclined edges of the wedge plates, so that when they are at the upper broader end the two halves are further apart than when at the bottom. The two under guide plates are attached respectively to the two hinged arms. One of these arms is prolonged somewhat past the joint, and is swelled out, so as to allow of a hole being made and tapped, into which the lower supporting rods are screwed. The topmost of the shaft rods terminates in a long screw, which has a lever, or handle, attached to the end, and by which the rods and apparatus are rotated. The handle and screw form an arrangement similar to that of a ratchet brace; so that when a nut on the screw is held tight the rods are not only rotated but lowered. In using this apparatus the necessary length of lower supporting rods are first lowered partly into the bore hole, so that the sawing or cutting apparatus can be attached. This is done with the guide plates, &c., at the lower edge of the wedge, and a sufficient length of upper shaft rods are then attached so as to reach the surface, when by holding the nut fast, and rotating the handle, the wedge is lowered so far that the saw blades press against the lining. By holding or slackening the nuts the pressure of the saw blades against the lining, and consequently the force required to rotate the apparatus, can be regulated. The lower end of the supporting rods has a pivot plate attached to it, which allows of the torsional strain on the lower supporting rods being reduced to a minimum. The working of the apparatus is exactly the same as that of an ordinary ratchet brace, and will be evident at once.

If from any reason it is impossible, or unadvisable, to have lower

supporting rods, the two guide plates, with the semicircular saw blades, can be supported from a special set of rods from the surface, ending below in a fork, to the two sides of which the upper guide plates are attached.

The following is a simpler but hardly so practicable arrangement. To the lower end of the shaft rods a short stiff rod is attached, to which two long arms are hinged; the lower ends of the arms carry the two semicircular halves of the saw blade, which is stiffened on its upper and under sides with thick plates. A strong wrought-iron bridge, rectangular in horizontal section and trapezoidal in vertical section, with the broader end downwards, embraces the two arms. A strong wrought-iron wedge is fixed across the bridge, so that two rectangular slits are formed between the wedge and the ends of the bridge, one on each side of the wedge. The two arms carrying the saw fit in these slits, so that the bridge can be slid up and down on the arms, in the first case causing the saw blades to recede, and in the second to approach each other. The bridge is attached to a long fork, the upper end of which screws into a special set of rods, reaching to the surface.

For cutting a lining in a vertical direction each of these instruments can be used, only in this case the saw blades, or cutters, must be placed vertical. A much simpler arrangement is preferable, and may suffice, like the following, which consists simply of a steel bow. The back of the bow and the cutting edge, or saw, are welded together above and below, the upper end terminating in a screw, by which it can be screwed on to the shaft rods, and the lower end forms a nut, into which the lower rods are screwed. Both the back and the bow of the saw are curved outwards; the spring of the steel bow, although not sufficiently strong to prevent the lowering of the apparatus in the lining without difficulty, suffices to press the cutting blade with a suitable force against the lining to ensure the cutting through of the lining when the apparatus has been repeatedly raised and lowered. Sometimes a special spring is inserted between the back of the bow and the blade.

When it is necessary to cut a lining the operation should always be commenced at the upper end of the lining, and as each part is cut loose it is raised to the surface before proceeding with the next.

CORE BORING.—Although there is in general no difficulty in ascertaining from the sludge or debris brought up from the bottom of a bore hole the character of the strata passed through, still under certain circumstances it may be not only doubtful but even misleading, when fallings-in from strata already passed through (owing to a softening of the strata or influx of water, or of the strata being quick) have taken place, and being pounded and mixed with the debris from the strata at the bottom of the bore hole in larger or smaller quantities, give it quite a different appearance. Indeed, cases have already happened where the boring tool has passed through coal without its being observed; and, on the other hand, when in passing through bituminous shales the existence of a bed of coal has been taken as a fact, only to be disproved on sinking to it. To obviate these disadvantages and risks core boring has been introduced, and is so called because its object is to bring up solid cores of the strata passed through, by which means unmistakable proof is obtained of the character of the strata. This core boring consists of two operations—the formation of the core at the bottom of the bore hole by boring round it, and the detaching and raising of the core to the surface. Perhaps the best arrangement for core boring is that of Capt. Beaumont. The machine, however, will be described under the head of "Hydraulic Boring."

As the borer for boring round a core is the same in principle for all boring apparatus—to give the cutters an annular arrangement, some of the cutters being placed radially, and some on the periphery—we shall only describe that of Herr Kind, devised as early as the year 1848, and which can be used with rigid rods, with or without a free falling apparatus, and with a rope. This apparatus consists of a long fork, on the upper end of which a screw is formed, by which it is attached to the shaft rods; the lower end forms a hollow cylinder, on the under side of which the cutters are formed, two of these being placed radially, and two on the periphery. The radial cutters are slightly broader than the thickness of the cylinder, so that the latter is not likely to get jammed between the core and the sides of the bore hole. The fall of the borer is much less by core boring than otherwise, and the blows are given with a proportionately greater rapidity. After the core has attained such a length that it is decided to break it off, the core grapple should be lowered as soon as possible, so as to allow the sediment but little time to settle down and harden.

The core grapple used by Herr Kind consists of two parts—a long cylinder, and a long rod terminating at the lower end in a fork, to which a heavy ring is attached. The cylinder is provided with three long vertical slits, to allow of the passage of the fine slime. Near the bottom of the cylinder are four slits, about  $\frac{1}{2}$  in. long and  $\frac{1}{4}$  in. wide, and at the same level a strong ring is rivetted to the cylinder on the inside. To this ring four spade-shaped cutters are hinged. The cylinder is attached to and lowered by means of the shaft rods, and the long rod, with the heavy ring, is lowered by means of the sludge rope. Of course, it will be understood that the interior diameters of the apparatus are large enough to allow of their readily passing over the core. The four spade-shaped cutters are bent inwards at the top, so that when the heavy ring is lowered down to the cutters they are forced inwards against the core, during which the cylinder is raised and lowered repeatedly about 3 in. and at the same time is gradually rotated until the core is so far reduced in diameter at the bottom as to break off readily when some force is exerted to raise the cylinder, and the core, that rests on the cutters, is brought to the surface.

Herr Zobel, whose free falling apparatus we have already described, makes use of the following arrangements for raising cores. It consists of two long arms, which are forked at their extreme lower end. These two arms are forged in one piece, which is bent horizontally in the middle (at the upper end), joining the two arms. In this horizontal portion is a tapered hole, through which a long screw passes, being attached at the upper end to the shaft rods, and ending below in a swivel joint, or hinge. To this two short arms are hinged, and each of these joins the end of one of two long arms, which cross each other (like scissors), being centred on a pin passing through the first pair of arms. The lower ends of these crossed arms are bent inwards. When, therefore, the rods are rotated, and the screw is raised, the upper ends of the crossed arms are drawn inwards, and consequently the lower ends are also drawn together, in such a manner as to lay tight hold of a core, or anything between them. This instrument is also used by Zobel for raising broken pieces from the bottom of the bore hole. Indeed, many of the tools we have described for this purpose can be equally well applied to raising of cores as core grapples.

ROPE BORING, OR CHINESE METHOD OF BORING.—It will be at once evident that with the use of rigid rods a great amount of time must be spent in screwing and unscrewing the shaft rods every time it is necessary to raise or lower them for the purpose of sludging the bore hole, and that while the time required for boring a given advance in rocks of nearly the same hardness continues approximately the same for any depth, yet the time occupied in raising and lowering the rods (which must, therefore, be first unscrewed, and then screwed together, requiring four to five hours for a depth of from 500 to 600 yards) increases with the increased depth of the bore hole, and when the hole becomes very deep the time required in merely raising and lowering the rods becomes much greater than that occupied in the actual boring and sludging operations. In fact, supposing we represent the total cost of the preliminary and bye work connected with the sinking of a bore hole by A, and the average cost of the boring and sludging of the advance made between two successive sludging operations by B, and the cost of the first screwing and unscrewing of the rods by a, and lastly the approximate cost of screwing and unscrewing the rods reduced on the advance made between two successive sludgings by d, then if n represent the quotient of the total depth of the bore hole divided by the amount of advance between two successive sludgings, the total cost, C, of the bore hole is given approximately by the equation—

$$C = A + nb + \left\{ 2a + (n-1)d \right\} \frac{n}{2}$$

From the above expression it is evident that the cost of a bore hole where rigid rods are used depends not only on the depth, but part of the cost increases as the square of the depth; where a rope is used, however, that portion of the cost is greatly diminished—the entire time occupied in screwing and unscrewing the rods (which forms the greater part of the total time occupied in raising and lowering the rods) is saved, and, besides, the velocity of raising and lowering can be greatly increased. Generally, from eight to ten minutes will suffice for raising and lowering the cutter with a rope. The above, however, may be said to be the sole advantages which the use of a rope possessed above that of rigid rods, especially when compared with the effects obtained by the use of the best free falling apparatus.

The rotation of the cutting tool cannot be effected so regularly, which in its turn leads to great irregularities in the contour of the bore hole, and these if they became excessive would soon put a stop to boring unless the sides were smoothed and rounded off with after cutters; besides, the boremaster cannot so readily perceive the nature nor any change in the strata met with, or any obstruction, as when he has his hand on the tiller or handbrake of the rigid rods. Besides this, in the case of breakage or wedging fast of the borer at the bottom of the bore hole a set of rigid rods must still be provided. To fulfil all the requirements for boring a rope, even if made of iron or steel wire, should whilst possessing sufficient flexibility to pass over a convenient sized drum or pulley be sufficiently stiff to prevent any extension or contraction, or arbitrary rotation, which latter, however, is only partially provided against by the use of a flat rope, the former evil still remains, so that when the bore hole is very deep there will always be a great uncertainty as to the amount of the rise and fall (i.e., the blow) of the borer.

This method of boring with a rope has also been called the Chinese method, on account of having been, according to some, first introduced from China. According to M. Jobard, in his Rapport sur l'Exposition de 1839, and in the Bulletin du Musée de l'Industrie 1846, the narrative of an Eastern traveller published 190 years ago at Amsterdam contains a notice of borings executed by means of a rope and iron tool (zyerhand) to very considerable depths by the Chinese. In 1827 this fact was confirmed by the missionary Imbert, who stated that in the province of Oa-Tong-Kiao, in a district 80 miles by 30 miles, more than 10,000 bore holes exist, which have been carried down generations ago for salt and naphtha springs, many of these exceeding 1800 ft. in depth, and some even reaching to a depth of 3000 ft. from which in some cases light carburetted hydrogen, &c., have issued in such quantity as to be used for heating boiling pans. This statement was, however, received in Europe with much doubt. M. Héricart de Thury wrote strongly against its probability. Notwithstanding M. Jobard made the attempt to use a rope at Marienburg, in Belgium, in the year 1828, but only attained a depth of 75 ft. in hard slate.

As it had been suggested that the missionary Imbert, having written only from hearsay, might have been misinformed, he undertook a journey into the district, and wrote back about 1831 to the Superior of the Missions at Paris, stating that he had seen and verified by measurement his previous report.

In 1832 M. Sello, Conseiller des Mines, devised an instrument for boring with a rope, and succeeded in sinking in the neighbourhood of Saarbrücken a great number of bore holes through the Bunter Sandstein (variegated sandstone) overlying the coal measures, some of them having a diameter of 18 in., and a depth of 80 yards. Unfortunately, the great publicity given to these trials caused the application of this system in a great number of other places, where the failure was so great as to bring the system into general discredit.

The operation of boring with a rope depends on the fact that a weighted rope uncoils or untwists itself; and, on the contrary, a rope from which the weight is suddenly taken coils itself, so that if a swivel be inserted between the rope and the borer, then whilst the borer is being raised the rope untwists itself, and imparts a rotary motion to the borer, in so far as the friction between the swivel and the upper end of the borer is greater than the torsion of the rope.

According to Imbert, the rope used in China was only about the thickness of a finger, and made by hand from bamboo fibres. M. Sello, at Saarbrücken, made use of hemp as the material for his rope. Aloe fibres have also been used. M. Jobard recommended an iron wire rope with hempen strings intertwined. A flat iron wire rope was used at Ehrenbreitstein in 1834, and a round iron wire rope was used at Chemnitz, in Hungary, in 1843.

The apparatus used by Jobard consisted of a cast-iron cylinder about 8 in. in diameter, and 3 ft. 4 in. long. The outside surface of the cylinder was fluted, in order to allow the debris and slime to rise between it and the sides of the bore hole. The upper end of the cylinder forms an empty inverted cone, in which the fine slime settles, and the lower end is cast in the form of a crown borer, in a chilled mould, to make the cutting edges sufficiently hard. A long wrought-iron rod passes through the centre of the cylinder, the

\* For the benefit of some of our readers it may be well to state that the term  $\left\{ 2a + (n-1)d \right\} \frac{n}{2}$  is the expression for the sum of an arithmetically progressive series of which the first term is a, the second a + d, the third a + 2d, and so on to n terms.



THE COAL TRADE.—Messrs. G. J. Cockerell and Co. in their 44th annual circular respecting the Coal Trade, say—"The winter of 1876-1877 was the warmest we have had—with one exception—for 36 years. The consumption of house coal proportionately diminished, and as fully the usual winter supply was forwarded to London, a glutted market enabled us to quote very low prices for a short time. Possibly some on this account hesitate to buy this summer. To such we would say that it is an act of the soundest economy to secure a winter stock of coal in the summer. Not only are prices almost invariably at the lowest point, but the coal can be supplied in the best possible condition, and it is certain that winter supplies are a good deal cheaper than summer supplies. In winter months, prices would reach a much higher level in the winter than they now attain, to the serious prejudice of the small consumer. During the last 12 months the history of the coal trade has been one of adversity. Failures and strikes have been of frequent occurrence, enterprises based on the expectation of a continuance of the high prices of 1875-1876 have been unable to bear the strain of the depression of 1876, and the working of several collieries has been brought to a halt. The result has been that the supply of coal has been fewer now than in 1871. Notwithstanding the fact that wages are now reduced very nearly to the old level, the operation of the Mines Regulation Act, and the lessened output per man (about one sixth) have added considerably to the permanent cost of getting coal. The gravity of the political situation over



The Master of the Rolls has appointed Mr. Edward Ashmead, of 62, Cornhill, official liquidator of the Trust Association (Limited).  
The Master of the Rolls has appointed Mr. Alfred A. Broad official liquidator of the Langhaile Skating Rink.



# The Bell Abbey & Falcon Cliff Mines

(LIMITED).

ISLE OF MAN,

CAPITAL £50,000, IN 10,000 SHARES OF £5 EACH,

(First Issue, £30,000.)

Deposit on application, £1 per share. On allotment, £2 per share. The remainder to be called up as required.

## DIRECTORS.

RALPH FAWSETT AINSWORTH, Esq., M.D., F.L.S., &c., Cliff Point, Broughton, Manchester.—CHAIRMAN.

EDMUND BUCKLEY, Esq., Wool Broker, Dale Street, Liverpool.

FRANCIS JAMES EATON, Esq., General Broker, Queen's Buildings, Dale Street, Liverpool; and Hesketh Park, Southport.

(Each of whom has subscribed for 200 Shares.)

With power to add to their number.

## BANKERS.

LIVERPOOL—The BANK OF LIVERPOOL, Water Street, Liverpool; AND GLYN, MILLS, and CO., London.

ISLE OF MAN—The ISLE OF MAN BANKING CO. (Limited).

## SOLICITORS.

Messrs. LACES, BIRD, NEWTON, and RICHARDSON, 1, Union Court, Castle Street, Liverpool.

## AUDITORS.

Messrs. J. S. and R. BLEASE, Public Auditors, Liverpool.

SECRETARY—MR. WILLIAM C. BEW.

## REGISTERED OFFICES.

COLONIAL BUILDINGS, 36, DALE STREET, LIVERPOOL.

## PROSPECTUS.

In offering to the public such of the First Issue of shares in this company as remain unsold, the directors are fully justified in believing the investment to be one which will amply repay those who avail themselves of it.

The directors have hitherto abstained from advertising, or taking any of the other modes usually adopted for the purpose of placing shares, and have preferred, with the aid of a few personal friends, to carry on the workings on a somewhat limited scale, and to defer appealing to the public till a revival in commerce should render it an easy task to obtain the capital necessary to do justice to the many and great points of interest in this eminently valuable property.

The time has, however, now arrived when they feel that the mine should be no longer only partially worked, or in other words, starved, and that its intrinsic value and promise have been so far established that no continuance of commercial depression ought to prevent their receiving applications for a far greater number of shares than they are now offering; and they have been more impelled to this by the discovery made to the north of the Bell Abbey workings, the conclusion being that the discoveries which are shown in the field marked B 315 on the plan accompanying the prospectus, it is hardly necessary to say that it is impossible to find more talented, experienced, or reliable, as well as successful, mining engineers than Mr. Walter Eddy, of Llangollen; and Capt. John Kitto, of Llandudno, the manager of some of the most prosperous new mines in the kingdom. And the directors have confidence that the very strong opinions expressed by these gentlemen in their reports, confirmed and supplemented as they are by the letter kindly volunteered by Capt. William Kitto, manager of the rich Foxdale Mines (whose thorough knowledge of the district and great ability render him second to no living authority) must satisfy the public that the shares of this company form an unusually sound and valuable investment.

The report of Capt. Richard Barwell, the company's mine agent, may also be implicitly relied on as being the result of well trained and mature judgment, based upon careful daily observation.

In calling attention to the annexed reports, it is hardly necessary to say that it is impossible to find more talented, experienced, or reliable, as well as successful, mining engineers than Mr. Walter Eddy, of Llangollen; and Capt. John Kitto, of Llandudno, the manager of some of the most prosperous new mines in the kingdom. And the directors have confidence that the very strong opinions expressed by these gentlemen in their reports, confirmed and supplemented as they are by the letter kindly volunteered by Capt. William Kitto, manager of the rich Foxdale Mines (whose thorough knowledge of the district and great ability render him second to no living authority) must satisfy the public that the shares of this company form an unusually sound and valuable investment.

The report of Capt. Richard Barwell, the company's mine agent, may also be implicitly relied on as being the result of well trained and mature judgment, based upon careful daily observation.

By those who already know or will take the trouble to examine the property, no reasonable doubt can be held that with a liberal and judicious expenditure of capital in developing the features which have now been established, it must speedily prove itself to be a most valuable and lucrative mine, or rather series of mines.

The greatest care has been taken in laying out the workings and buildings, and in securing the best class of engines, machinery, and other appliances, under the superintendence of Mr. A. Francis, of Rhoel-Idu, Wrexham, and in all these respects the mine may challenge the severest criticism.

The property is now held under Crown lease at unusually low rents and royalties, and has the special advantage of water power, which will obviate the necessity for erecting additional permanent steam power to carry out proposed new workings.

The purchase money to be paid by the company is £9000.

No promotion money will be paid.

The remuneration of the directors will be fixed by the shareholders in general meeting.

In the event of no allotment being made to an applicant, his deposit will be returned in full.

The deposit on application for shares may be forfeited, and the allotment cancelled, by the directors in all cases where the further payment on allotment is not duly made, in accordance with the terms of the allotment letter.

Copies of the Articles of Association, the surveyors' reports, the provisional agreement, &c., can be inspected at the Solicitors' and the Secretary's offices.

The only contract entered into is one bearing date 1st March, 1876, between Ralph Fawcett Ainsworth, M.D., Edward Wingham Bird, Edmund Buckley, and Francis James Eaton, as vendors, and William Charles Bew, as purchaser, on behalf of the new company.

Prospectuses and Forms of Application can be obtained from the Bankers and Solicitors, and at the offices of the company.

Applications for shares will be received by the company's Bankers.

## REPORTS.

To the Directors of the Bell Abbey and Falcon Cliff Mines (Limited).

18th Inst., April 30th, 1877.—GENTLEMEN: We inspected your mine on the 18th inst., and after careful consideration submit to you our report thereon, more especially referring to what we advise as to the future workings. Your shaft is sunk 72 fms. below adit, and levels driven for considerable distances north and south, at intervals of 12 fms.

The level is of great width, and the promising indications it showed almost at places, and the frequent bunches of ore (lead, copper, and blende) met with throughout fully warrant, in our judgment, all the trials which have been made. (The copper already sold by you, as well as that we saw in the mine and at surface, is certainly of superior quality. The lead and blende we take as being about the average of Manx ores.)

These bunches of ore have always occurred where the lode has become firm and compact, but as it is disturbed by occasional slides and bands of shale—which may possibly continue to some extent even in depth—we would advise you to let the ore ground now laid open in the various levels on tribute (which would at the same time be proving that part of the mine), and devote your principal energies to the ground north and south, where your acquisitions of additional land, and trials at surface, would appear to have established two distinct mines free from the disturbances alluded to.

First, the South Ground: Having acquired an additional length of 300 yards, which actually includes the great Dowke east and west lodes, at the junction with which the principal part of the lead ore and the adjoining mine has been found, you are now at liberty to resume your driving south, which is to be stopped pending your negotiations; and we cannot doubt but that you will quickly meet with at least equal success with your neighbours, the distance to be driven being but short; and it is in exactly similar positions that all the productive mines in the Isle of Man, particularly Great Laxey and Foxdale, have made their great lodes. In short, you cannot fail to intersect these great Dowke lodes, and we have every confidence that you will meet with good and profitable discoveries of ore in this direction.

Second, the North Ground: Here your tracing a newly found ore-bearing lode from the adjoining mine, through the field in your property marked No. 315 on the large ordnance map, has resulted in the discovery of at least three new lodes, forming junctions with each other in positions leaving nothing in this respect to be desired, and your trial pits prove them to be of the most promising character. As you are equally impressed with ourselves of the great importance of this part of your set, we need not say more, but cannot too strongly urge your commencing operations without delay.

The entire property is very extensive, being about two miles on the course of the main lodes. The machinery is in excellent working condition, and of the best construction. New leases have been obtained on the most reasonable terms, and the additional land to the south (to which reference has already been made) combine to constitute it one of the most promising mining sets in the whole Island.

In conclusion, we have no hesitation in recommending you at once raising the necessary capital to carry out the workings which we have indicated, and we believe that you will have occasion to be perfectly satisfied with the necessary expenditure required to develop what you have a right to regard as a thoroughly sound and promising mine.

JOHN KITTO, Manager of the Grosvenor, Wye Valley, Red Rock, South Cymruyst with, St. Harmon, West Goginan, and other Mines.

Copy of Letter from Capt. WILLIAM KITTO, Manager of Foxdale Mines.

18th May, 1877.—DEAR MR. BEW: I have read Mr. Eddy's and my Brother's report, and having been frequently through your mine, I can endorse all it contains. If it errs, it is on the side of caution; but there is one point upon which I think none of you lay sufficient stress—I mean the driving of your adit northwards.

I have often said to you that were I in a position I would risk my own money here, trusting solely to what I could discover as payment or remuneration for my outlay, as to my mind courses of ore are sure to be found making up to the surface, as they have done so close to you in the adjoining mine; besides which, you have the advantage of the level as the natural drain. When you are in a position to employ more labour, allow me to urge that this be one of your first operations. I believe you may safely rely on the results.

WM. KITTO.

Bell Abbey and Falcon Cliff Mines, Colly, Isle of Man, May 8th, 1877.—DEAR SIR: Capt. Eddy and Kitto having lately inspected your mine, I will confine my remarks to their present operations and a few suggestions as to the future.

from the sump which communicates with the 60, but this is pretty well exhausted, as the ore ground is limited in this direction by the crossing of a strong floukan course. We are now making preparations to "stop" north. I would remark here that it is from this section of ground we have been raising nearly all our copper. Two men are employed in driving an intermediate level between the 45 and 60, off from a rise 30 fms. north of shaft, with a view of proving a succession of short bunches of lead that were passed through in both of these levels. So far the lode has not been sufficiently productive to pay cost for driving; but some very good patches of steel lead have been met with.

55 North.—There is a "stop" in the roof of this level worked by four men. The lode is 4 ft. wide, mixed throughout with lead and blende ores, which can be worked at a profit. This section of ore ground extends at least 15 fms. in length, and is looking a great deal better going up. From this stoop we have a large pile of ore stuff, which we are now in the course of dressing.

24 South.—The drainage of this level has been recently resumed, and on account of its being in the immediate neighbourhood of several known cross-courses, which have caused the lodes in the adjoining set to be productive of good ore, we may reasonably expect that it will be successful. The lode in the forebreast is well defined, and presents a very encouraging appearance. Not far from the present end there is a shaft sunk in the Glen by former parties, in which there is said to be a good rib of lead. This we shall quickly prove.

Adit Level: Exploratory operations constitute an important element in the opening out of mines, and judging by the results of our neighbour's working in an exactly similar position, I would strongly recommend its further extension northwards at once.

I would beg to call your attention again to one or two undeveloped points, especially to where some trials were made some time since, about the centre of your ground, marked 315 on the Ordnance map. Three very strong lodes were discovered forming junctions within an area of a few fathoms. Every miner knows that it is at these intersections that success as a rule is secured, and I really hope you may, without further delay, instruct me to begin operations upon a more extended scale. With your intimate knowledge of the nature of the various lodes, you at least cannot doubt the result.

R. BARRELL.

Mr. WILLIAM C. BEW.

Extract from Report, 12th May, 1877.

I am glad to tell you the stoop in the roof of this level (the 36) is gradually improving going up. I never saw it looking so well as it is to-day, and the men say they never saw anything in the mine so good.

Dressing: We are getting on with this—crushing the copper to-day, and have a good pile of lead broken up for crushing.

Extract from Report, 21st May, 1877.

24 North: I put two men here to-day, and find there is some very nice lead in the roof. No doubt is a continuation of that we have in the 35 stoop.

## FOREIGN MINES.

RICHMOND CONSOLIDATED.—R. Rickard, May 28: Since my last there has not much work been done in the rise in back of the 500 west, on account of want of air. We are now up over 70 ft., with ore still in the back. We have been cutting out on a level of 500 drift, and putting in timber: where we have opened on the ore it is looking very well. The winze below the 500 is down 50 feet, with ore in the bottom. The 600 drift is progressing favourably; we shall soon have this drift under the winze, when we shall rise to make communication. We have started a drift from the 400 main drift, in a westerly direction, to intersect the rise in back on the 500 drift; we have about 100 ft. to drive, and the ground is very favourable. The repairs to furnaces and machinery are going on well. I expect to draw it to a close by the end of the week.

BRITANNY MINERALS. J. Edwards, June 15: We put the new pumping-engine to work last Saturday evening, and on Tuesday night it forked the water in the bottom, and I am pleased to say the engine and all its connections are in good order. In the same level we met the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

ALAMILLOS.—June 13: The lode in the 50, west of San Felipe's shaft, is small and unproductive. The 40, west of this shaft, produces stones of ore. The 20, in the same direction, is opening profitable ground, worth 1 ton per fathom. In the 25, west of Abercrombie's shaft, there is a small branch of lead ore, but nothing to value. The lode in the 40, west of this shaft, has again become productive, yielding 3 1/2 ton per fathom. The 50, west of La Magdalena cross cut, produces 1/2 ton of ore per fathom. The lode in the 100, east of Taylor's engine-shaft, lets out more water, but is unproductive. The same level west has improved, and is now worth 1 ton of ore per fathom. The 85, west of San Adriano's shaft, yields 3 1/2 ton per fathom; nothing of value has yet been intersected in the 60, east of San Victor's shaft. In the same level west the lode yields 1 ton of ore per fathom. A cross-cut is being driven south at the 30, east of San Jose's shaft, to intersect the lode. The 50, east of Judd's engine-shaft, has fallen off a little in value, being worth at present 3 1/2 ton per fathom. The 70, west of Judd's shaft, is being driven through an unproductive bar of granite. The 50, east of Judd's cross-cut, is unproductive. In the same level west the lode is small and poor. Good progress is being made in sinking San Victor's engine-shaft below the 60. Sanchez winze has reached the depth for a 50 ft. level, and the lode has increased in value to 3 1/2 ton per fathom. Timoteo's winze below the 85 is now worth 1 ton per fathom.

were kept up very well in the past month, and the stoops are producing the usual quantity of ore at present. The works at surface are going on very regularly, and the machinery is in good working condition. We estimate the raisings for June at 450 tons.

LINARES.—June 13: Pozo Ancho: In the 120, east of St. Tomas engine-shaft, the lode is large and strong, but does not contain any ore. The lode in the 100, east of Warner's shaft, is disordered and poor. In the same level west the lode is open, and yields 1 1/2 ton of ore per fathom. The 120 ft. level cross cut, south of Peill's shaft, will be driven out towards the lode with all speed. The 105, west of Peill's shaft, is opening ground worth 1 ton per fathom. The lode in the 90, west of this shaft, is compact and regular, and produces 2 tons of ore per fathom. The 65 being driven in the same direction continues unproductive. The lode in the 105, east of Peill's shaft, is improving, yielding 1 1/2 ton of ore per fathom. In the 90, east of San Francisco shaft, the lode is regular and well defined, and yields 2 tons per fathom. The lode in the 75, east of this shaft, is small and poor, and the ground hard for driving. The 65, east of San Francisco shaft, is without anything to value. In Santo Tomas engine-shaft the pitman is fixing a plunger lift at the 120. No. 217 winze is holed to the 65. In No. 213 winze below the 55 the lode is small and unproductive.

Quintones Mine: Satisfactory progress is being made in driving the 100 cross-cut, south of Taylor's engine shaft, considering the hardness of the granite. The 90, west of Taylor's shaft, is poor. The lode in the 80, driving in the same direction is open and strong, and yields good stones of ore. In the 90, east of this shaft, the lode is regular, but of no value at present. In the 80, east of Addis's shaft, the lode is large and strong, consisting of carbonate



**LLANIDLOES.**—J. Kitto, June 16: I am pleased to inform you that pretty fair progress is being made in the sinking of the engine-shaft below the 72, and the lode appears to improve in character as we get deeper, and is yielding a little ore, but as we are only carrying a comparatively small part of it in sinking I cannot











175

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



### Notices to Correspondents.

\* \* \* Inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be read on receipt; it then forms an accumulating useful work of reference.

**IMPORTANT NOTICE—REDUCTION OF POSTAGE ON THE "MINING JOURNAL."**—In consequence of the new Postal Convention, which came into operation on July 1, the postage of the *Mining Journal* to many countries will be reduced to one fourth. Henceforth the subscription will be 1/10s. 4d. per annum (39 frs.), postage included, for the following countries. The amount will, if desired, be collected at the subscriber's residence at the end of each year. The subscription continues until countermanded:—Austria, France, Belgium, Denmark (including Iceland and the Faroe Islands), Egypt, Germany, Gibraltar, Greece, Heligoland, Italy, Luxembourg, Netherlands, Norway, Portugal (including Madeira and the Azores), Roumania, Russia, Serbia, Sweden, Switzerland, United States, Malta, Turkey, Morocco, Tunis, and the Canary Islands. Spain 1/10s. 50 frs.

Received:—C. C. (Southdown): Letter was addressed "Southsea"—"M. W."—F. H. (Crediton)—T. E. (Mimoria)—"One Interested"—Menhiet miner's departure—Reader—"F. H." (Tavistock)—"M. P." (Colne)—"H. S." (Birmingham): We shall be glad to have the particulars—"Observer" (Parys Mountain)—"Shareholder" (Van Consoles)—"M. de R." (Paris)—"Tourist" (St. Agnes)—"H. P. B." (Norwood)—"Shareholder" (Old Treburgett)—"Shareholder" (Van Consoles)—"Shareholder" (Roman Graves) should attend the meeting, and ask for the information he requires—"Enquirer": Dr. J. Foulerton, Pembridge Villas, Bayswater, is the Secretary of the Geologists' Association.

## THE MINING JOURNAL, Railway and Commercial Gazette.

LONDON, JUNE 23, 1877.

### OUR COAL ABROAD.

Our coal exports have been moving on at a good rate this year, although they have been scarcely so large as in the corresponding period of 1875. Including coal—that is, coal, coke, cinders, and patent fuel—shipped for the use of steamers engaged in the foreign trade, 1,876,901 tons of coal were sent away from our shores in May, 1877, as compared with 1,844,544 tons in May, 1876, and 1,496,334 tons in May, 1875. The aggregate shipments for the five months ending May 31 this year did not, however, exceed 7,306,122 tons, as compared with 7,377,051 tons in the corresponding period of 1876, and 6,008,171 tons in the corresponding period of 1875. It is also noticeable that our coal exports to France have been rather falling off this year, having amounted to May 31 to 1,223,245 tons, while in the corresponding period of 1876 they were 1,365,057 tons, and in the corresponding period of 1875, 1,037,574 tons. It may be supposed by casual observers that the declension noticeable in this year's figures is attributable to the agitation arising out of the dubious policy recently inaugurated by Marshal MACMAHON, but this can hardly have been the case, since our coal exports to France in May amounted to 261,665 tons, while in May, 1876, they did not exceed 255,196 tons, and in May, 1875, 212,363 tons. We should be rather disposed to conclude that the slight falling off observable in the consumption of our coal in France this year was due to the dulness which prevailed, upon the whole, in French industrial operations, as well as in the industrial operations of Great Britain. The beetroot sugar crop was not a good one in 1876; the last French beetroot sugar manufacturing season was, consequently, a comparative failure, and the consumption of coal involved by it was smaller than the corresponding consumption in the season of 1875-6. Hence a certain additional quantity of French coal was thrown unconsumed upon the French market, and some of our coal would appear to have been displaced from them in consequence. However, the decline which has taken place in the consumption of our coal in France this year has not, after all, been of very much importance, and it may very possibly be recovered before the year has fully run its course. Germany ranks next to France among the foreign consumers of our coal, and the German demand has fallen off this year, as well as the French. Thus we sent 687,176 tons of our coal to the Germans to May 31 this year, the corresponding movement in the same direction in the corresponding period of 1876 having been 777,333 tons, and in the corresponding period of 1875 622,745 tons. Our deliveries of coal have rather increased this year to Russia. Our shipments have also been larger to Sweden and Norway, Spain, Turkey, Egypt, Malta, and British India; but they have fallen off as remarks Denmark, Holland, Italy, and Brazil. Upon the whole, as has been already observed, our coal exports have barely held their own this year.

When we come to make comparisons in the by no means unimportant matter of prices, we arrive at rather startling results. Thus while 1,231,125 tons exported in May, 1875, were valued at 832,654/1, 1,536,202 tons exported in May, 1876, were priced at no more than 856,877/1. The decline in prices has acquired even greater importance during the last twelve months, as is proved by the fact that 1,562,265 tons exported in May, 1877, were priced at the still smaller sum of 787,967/1. In making these latter comparisons we have not included coal shipped for the use of steamers engaged in the foreign trade; the figures given relate solely to direct exports. A similar result is observable when the comparison is extended to the first five months of this year. 5,871,774 tons exported to May 31 this year being priced at only 3,034,463/1, as compared with 4,767,589 tons priced at 3,377,428/1 in the corresponding period of 1875.

### THE SUB-WEALDEN EXPLORATION.

After boring to a depth of 1905 ft. the Sub-Wealden exploration has been brought to a close without effecting the main object for which it was commenced; still, through the exertions of Mr. WILLETT, a good deal of light has been thrown on what was previously little more than matter for speculation. In the brief notice from Mr. WILLETT, which appeared in last week's *Journal*, he alludes to the scientific deductions of Prof. PRESTWICH with respect to the Palaeozoic rocks, which were not found at the depth bored to. But there is no reason why those rocks should not be found, as Mr. WILLETT suggests, at other points in the South-East of England, or in the valley of the Thames. A little more importance may be said to attach to the subject from the fact that only last week there was a meeting in Paris of the Association for Constructing a Tunnel between England and France, when a report was read of the explorations made and soundings executed last year. The borings made by Mr. WILLETT have some connection with the scheme alluded to, for the zone in which it is proposed to pierce the tunnel, it is said, consists of a bed of clay perfectly continuous and homogeneous, so that the excavations could be made between the two shores through the same chalk system, and that gentleman proposes that the tunnel should be made through the Kimmeridge clay, which he proved to be over 600 ft. thick in the Sub-Wealden boring. On the other hand, Prof. PRESTWICH thinks that chalk would be unsuited for tunnelling, because of the lateral pressure of inland springs, and the probability of meeting with fissures, whilst the Palaeozoic rocks, which at Folkestone would be found at from 300 to 400 ft. below the sea level, would be better adapted for tunnelling. The Professor, in the same paper to which we have alluded, pointed out the light which explorations of the Palaeozoic rocks must throw upon the question of the possible occurrence of coal measures beneath the South-East of England. This is a most important matter, and although the Palaeozoic rocks were not reached by Mr. WILLETT, there is no reason why they should not be met with at a considerably less depth than was gone to in the Sub-Wealden boring in other parts of the South-East of England. From the borings made at the brewery of Sir HENRY MEUX and SONS, London, the Palaeozoic rocks of the Devonian period were discovered, so that some of the Mesozoic or Secondary rocks, and the upper Palaeozoic, consisting of the Permian and Carboniferous—the Devonian or Old Red generally found resting on the latter—being entirely wanting. This, of course, puts entirely out of consideration the finding of coal in the London district; but that those measures may be met with in some of the adjoining counties there is very little doubt. Rocks, it may be said, are divided into three classes—the Tertiary, the lowest being the London clay and the Thanet sands; the Secondary, which includes

the Cretaceous formation, the Wealden, Oolitic, and Triassic; and the Primary or Palaeozoic, which commences with the Magnesian limestone, following downwards by the New Red sandstone, coal measures, Carboniferous or Mountain limestone, and the Devonian or Old Red resting upon the Upper Silurian, consisting of Ludlow shale and Wenlock limestone.

This description of the strata will show that where the Palaeozoic rocks of the Devonian period are reached without passing through carboniferous strata no coal is there. The want of these measures may be accounted for in various ways, for during the geological periods deposition of certain materials went on uninterruptedly during the whole period in a certain area, in another locality during part of it only, whilst in another there would have been no deposition whatever, whilst disturbances would take place in one locality and not in another. We have a striking instance of this in Staffordshire, where the vast series of the Old Red Sandstone and the Carboniferous limestone series are entirely wanting, the valuable deposits of coal resting on the Wenlock limestone of the Upper Silurian. We merely adduce these facts to show how important it is that the problem commenced by the Sub-Wealden boring should be continued until it is thoroughly solved by operations in some other locality where the chances of success are more favourable, for there is no doubt whatever but that there are vast reservoirs of coal concealed in many parts of England that will be brought to light to the great benefit of the country. We do not wish it to be understood that the object of the boring was for the purpose of seeing whether coal was to be found in a certain locality or not, but at the same time we thought it quite probable that where the Upper Palaeozoic rocks penetrated the Carboniferous measures would have been met with. This, we believe, is also the view of Mr. GODWIN-AUSTEN in his very able paper, in which he discussed the question of the probable extension of the coal formation beneath the Somersetshire coal field. He pointed out the probability that the coal measures which tail out under the chalk near to Therouanne set in again near Calais, and thence proceeded in the line of the Thames valley parallel with the North Downs, and proceed under the valley of the Kennet. Professor PRESTWICH appears to agree with Mr. GODWIN-AUSTEN as to the existence of a coal trough broken into several detached portions, and with the evidence generally given by that gentleman before the Royal Commission. It is, therefore, to be hoped that the solution of the important geological question so ably initiated by Mr. WILLETT will not be allowed to rest in its present unsatisfactory state, but that fresh borings will be made either in the valley of the Thames or at other points in the South-East of England, and there ought not to be the slightest difficulty in obtaining the necessary funds, from the landed gentry in particular, who would be so greatly benefited were the views we have enunciated, or rather adopted, from such a high authority as Mr. GODWIN-AUSTEN, realised.

### THE DYNAMITE PATENT.

The result of the trial before Mr. Justice Fry of the validity of the patent held and worked by the British Dynamite Company and Nobel's Explosive Company was given in last week's *Journal*, but from the interest taken in the matter a more detailed statement of the case is published in another column. Nobel's claim of 1867 embraced the absorbing of nitroglycerine in porous unexplosive substances. Kieselguhr, the absorbent actually used in dynamite, is non-explosive but not porous; in lithofracture the absorbents used consist of both explosive and non-explosive substances. The Judge held that the use of any non-explosives in combination with nitroglycerine infringed the patent.

The counsel for the plaintiffs were Mr. Aston, Q.C., and Messrs. Cutler and Chester, instructed by Messrs. J. and R. Goole, solicitors. The defendants were represented by Mr. Cotton, Q.C., and Messrs. Nalder and Macrory, their solicitor being Mr. E. Woodard. The witnesses for the plaintiffs were Dr. Odling, F.R.S.; Dr. Dupré, consulting chemist to the Home Office; Mr. W. T. Fewtrill; and Mr. George M'Roberts, the chemist to the British Dynamite Company, who thoroughly proved the chemical part of their case. Mr. Newton, the patent agent, was also called with respect to the patent. Mr. James Toye, a practical miner, was called to prove that whilst lithofracture was scarcely so strong as dynamite, the fumes were the same; and Mr. George H. Daw, the eminent gun-maker, of Threadneedle-street, was called to contradict a witness for the defence on the same question of fumes. The plaintiffs further called Mr. Orlando Webb, a mine and quarry owner, who proved that the description given in the specification was ample, and that it had enabled him to use up a quantity of nitroglycerine in his possession by turning it into a very serviceable dynamite, which was consumed in his own quarries.

The witnesses for the defence were Mr. Perry Fairfax Nursey, C.E., Mr. I. S. Linford, Dr. Adolf Gault, Mr. T. W. Keats, the chemist to the Metropolitan Board of Works, and Dr. Voelcker, the well-known agricultural chemist. The whole of these witnesses so far strengthened and proved the plaintiff's case that Mr. Justice Fry did not consider it necessary to call upon Mr. Aston to reply to the defendants' case. The case altogether was an exceedingly interesting one; it ran over four days, and was conducted by the leading counsel on each side with great ability.

### COLLIERY PROSECUTIONS.

The cases relating to the Hagside Colliery, Radcliffe, near Manchester, belonging to Messrs. A. Knowles and Sons (Limited), referred to in the *Mining Journal* of last week, were heard at Bury, on Thursday, the 21st inst., before Richard Bealey and Edward Mucklow, Esqs. Mr. Samuel Mills, manager of the colliery, was fined for allowing open powder to be in the pit 2/10s.; for having only one door, where there ought to have been two, between the main intake and return air-courses, 1/1; and for not having a correct report book, under General Rule 29, 1/1, with costs.

Mr. J. Heap, the agent of the colliery, was also fined for not proving that he had taken all reasonable means to prevent the contravention relating to the powder, 2/10s.; and as to the report book, 1/1, with costs.

The summonses were issued at the instance of Mr. Dickinson, Her Majesty's Inspector of Mines, Manchester.

**THE CONSUMPTION OF COAL, &c.**—A marked change has undoubtedly taken place with respect to the home consumption of coal, which has set at defiance the calculations of Sir W. Jackson, Prof. Devons, and all our great authorities who have written upon the subject. The annual increase in the production up to within a year or two ago from the year 1854 was at the rate of nearly 3,000,000 tons per annum, and on this basis the exhaustion of our coal fields in a given time were formed. But facts have turned out against the prophets, and that most unmistakably. According to the report of the Inspectors for 1876 recently issued, it appears that the increase in the quantity of coal raised in the United Kingdom during that year over 1875 was only 818,681 tons. But this increase was not occasioned by the want of home consumers, but quite the contrary, for it was considerably more than swallowed up by the marked increase in our exports. The quantity of coal exported in 1875 was 14,544,919 tons, and in 1876 it was 16,265,839 tons, or an increase on the year of 1,720,920 tons. If from that we deduct the increase of 818,681 tons, it shows that 902,239 tons less of coal was consumed in the kingdom in 1876 than in the previous year. It is evident that high prices have led to greater economy taking place in our houses than was ever the case before, and does away with the anticipations of our ablest experts on the coal question, as well as the alarmists. The increase in our exports is in a great measure due to the low prices at which our colliery owners have been compelled to sell to maintain their position in many of the European markets against the competition of German owners, who have been endeavouring to undersell us. But the English coalowners have made considerable sacrifices to hold their own, working without profit—a fact which the miners and their leaders will scarcely give them credit for doing. But that they have done so we need only look

to the Board of Trade Returns, from which we find that the value of coal exported in 1875 was 11s. 4 1/2d. per ton, and that for 1876 only 10s. 3 1/2d. per ton. These facts speak for themselves.

**COAL AND IRON IN THE UNITED STATES.**—The market for steel rails has continued quiet at Philadelphia at about late quotations; dried tons each are reported at \$47 to \$47 1/2 per ton currency at the mills. There are some enquiries for steel rails for South America made to meet foreign competition. The Pennsylvania Steel Company shipped during May upwards of 7000 tons of steel rails, its actual production for the month having been 6040 tons. Iron rails are quoted in Pennsylvania at \$33 to \$36 per ton currency at the mills. Steel rails are quoted at \$33 to \$39 per ton currency at the mills. There has been scarcely any change in the demand for manufactured iron at Philadelphia, except for bridge iron, which has been in active request. Business in manufactured iron has been in rather a dull and unsatisfactory state at Pittsburgh, but some little improvement is anticipated next month. The rail market has been rather dull at Pittsburgh. Business in steel has fallen off during the last few weeks at Pittsburgh, but makers are still generally busy, many of them having sold considerably ahead of their production. The total production of anthracite and bituminous coal in Pennsylvania to May 20 this year was 8,791,758 tons, against 7,021,718 tons in the corresponding period of 1876, showing an increase of 1,770,040 tons this year. The movement of coal and coke over the Pennsylvania railroad to May 21 this year amounted to 2,837,855 tons.

**QUICKSILVER.**—The following figures show the depreciation in the value of quicksilver. Imports:—

	Lbs.	Value—£.	Average per lb.
April, 1875	453,900	93,600	4s. 2d.
April, 1876	554,755	73,702	2 7
April, 1877	545,855	55,682	2 0

**MR. JOSEPH PRYOR, F.R.S.**—The numerous friends of Mr. Joseph Pryor, of Redruth, have learned with regret that he is on the eve of leaving England to inspect and report on mineral properties in Australia, Tasmania, and New Zealand. He goes out as a commissioner of several gentlemen in London and elsewhere. He carries with him the best wishes of all his friends, of enemies he has made none. Mr. Pryor's qualifications are of a high order, from his education, followed by practical experience, in the sciences of geology, mineralogy, assaying, and mine surveying, so that his employment on an extensive scale may be calculated as certain when his talents become known in the countries whither he goes. He has also the advantage of a high moral character, having always avoided the follies and vices usually incident to youth, and maintained a good reputation.

**PEAT CHARCOAL.**—We learn from Oswego that Mr. Joseph Lee, an experienced engineer, has left for Dublin, bringing some peat from the Syracuse Peat Works, for the purpose of demonstrating the Dodge process of condensing peat, so as to be nearly or quite the equivalent of English coal. Mr. Lee visits Ireland as an apostle of love, to carry the great discovery as a boon to his country for utilizing her valuable and immense deposits so as to be a first-class fuel. Peat charcoal is to be a great success.

**ANCIENT MINING IN IRELAND.**—There is a very interesting article on Ancient Mining in Ireland in a late number of the *Kilkenny Archaeological Society's Journal*. After speaking of the workings in various parts of Ireland, the writer turns to West Cork. Ancient mine workings have also been discovered in the west of the county of Cork. In 1846 Capt. Thomas, an experienced Cornish miner, while searching for copper on the lands of Derrycarhoon, near Ballydeob, came on some ancient workings; a neighbouring gentleman communicated to the late Mr. John Windele an account of the discovery, in which he states that they were six in number, all parallel bodies, one was about 30 fms. in length, 10 fms. deep, and 10 ft. in breadth, they were found filled at the bottom with rubbish, and at top were overgrown with peat in some places to a depth of 14 ft. A number of stone hammers were found at the bottom of the mine weighing from 3 to 7 lbs., similar to those already described as found in the bottom of the old workings at Kilkenny, also a curious sort of tub of oak, of a curved form, which was in the Dublin Exhibition in 1853, and a ladder of black oak 18 ft. long, formed of a single solid piece, having 14 steps notched in the side. The lands of Derrycarhoon are stated upon competent authority to abound in mineral wealth—the green carbonate of copper occurring near the surface.

**THE DARCY LEVER EXPLOSION.**—Some remarkable revelations were made on Wednesday at the adjourned inquiry into the explosion at Fogg's Pit, Darcy Lever, near Bolton. The explosion occurred on Feb. 17. Ten men were killed, but, owing to the pit taking fire, four of the bodies have only just been recovered. The coroner (Mr. J. B. Edge) was assisted in his inquiry by Mr. Maule, Q.C., who had been instructed on behalf of the Treasury. The evidence showed that the pit was comparatively free from gas, the last time gas was reported to the manager being June 21, 1876. The book was never brought up the pit until it was filled, and only a portion of it could now be found. A collier named Huntley said they never knew until they tried themselves, whether the pit was safe. There was no one to lock their lamps before they went down the pit. Abasalom Norris, the fireman, was supposed to examine all the working places, but he never marked them as safe or fiery. He met the men once or twice a week at the bottom of the jig brow, and told them he had examined the places, and sometimes James Norris, his father, asked them to make the examination themselves. At other times they had to trust to all being right. After trying the places with safety-lamps, the men used to light candles and work with them. Powder was used in the mine, but there was no shot lighter, and the men fired their own shots. These things were never mentioned to the manager, because (said Huntley) the men were afraid of being dismissed. The enquiry was again adjourned. [This evidence was denied on the following day by Abasalom Norris, who stated that he never failed to see all was safe before work was commenced.]—The inquest was adjourned until July 23, by which time it is expected the remainder of the bodies will be found.

**SIMULTANEOUS BLASTING BY FRICTIONAL ELECTRICITY.**—On Saturday, June 16, a visit was paid by Mr. T. Atkins, Swanton, agent for Nobel's Explosives Company, accompanied by Mr. Harris, an officer of the company, to the noted granite quarries of Messrs. Ellis and Everard, situated at Bardon Hill, Leicestershire. Previous to their arrival extensive preparations had been made under the superintendence of Mr. Smith, the foreman of the works. The blasting operations were performed on two sections of the quarry 130 yards apart. In each section three holes were drilled to an average depth of 20 ft. by Dunn's Rock Drilling Machine, and a charge of 15 lbs. of dynamite was then placed in each hole. Capt. Braid's Electric Fuse was then carefully inserted into each charge, and the whole connected by a well insulated copper wire. The two sections were then coupled by a main cable, and formed an electric circuit with the machine. This was one of Capt. Braid's High Tension American Improved. It is a small instrument, only 13 inches by 13 inches and 5 inches thick, in a small oak box, and weighs only 14 lbs. It is not liable to damp, will give a spark 2 inches long, and when charged one set of plates in the condenser are at a higher and the other at a lower potential than the earth. This is the great advantage. After a careful inspection of the cable, its connections, and all needful precautions taken, the whole of the six charges were fired at once, and a loud report was heard from both sections of the quarry at the same instant. Upon examination of the results, in one section it was found that a mass of rock 44 feet long, 40 feet wide, and 65 feet deep, weighing upwards of 9000 tons was dislodged and thrown down into the bottom of the quarry. In the other section, and here the work of demolition was still more complete, the mass of rock thrown down measured 42 feet long, 35 feet wide, and 50 feet deep, and estimated to contain upwards of 5500 tons. The charging, insertion of electric fuses, and completing circuit, undertook considerably less than two hours. Mr. B. Everard



one of the proprietors, was present, and was highly pleased at the manner in which the work was performed, and the satisfactory results obtained. These experiments were upon a far larger scale than any which have been attempted in the Midland Counties.

**MINING ARBITRATION.**—Capt. Southey, of West Chiverton and other mines, has just returned from Sweden, after a fortnight's absence, during which time he has successfully arbitrated in an important mining dispute in that country. The dispute arose out of the practicability, or otherwise, of dressing certain lead and blende ores, and Capt. Southey's opinion is that they can.

#### REPORT FROM CORNWALL.

June 21.—A little before Christmas we were hoping that the New Year would see an improvement in the Tin Trade. Then our hopes were postponed until spring, and then again until summer; and now that midsummer is just come, not only is there no improvement, but tin has been even lower than it was when the year started. Yet it would be unfair to deny that while expectation has yet to be postponed the prospect is somewhat brighter. There are not wanting indications that the struggle which the Old Country has been waging with her colonies is far more likely to be settled in favour of the home producers than it at one time appeared.

Although there are the names of 193 mines and underground workings under the Mines Regulation Act set down in the report of Dr. Foster for Cornwall, and 56 for Devon, making a total, therefore, of 249, we very much question whether there are more than 100 or so in what may be fairly termed active work. There are a few concerns, to begin with, which are not metalliferous at all. Of those that are metalliferous there are set down for Cornwall 85 of tin, 19 of copper, 19 of iron, 4 of manganese, 15 of lead, 37 of tin and copper, while the others include silver, copper and zinc, copper, lead and zinc, arsenic, pyrites, arsenic, tin, and silver, copper, tin, and arsenic, and even more miscellaneous mixtures. Devonshire is set down for 9 mines of tin, 14 of copper, 9 of iron, 9 of manganese, and 6 of lead. That the 28 mines of iron did not do very much is evident from the significant fact that their total produce for the year was just 21,000 tons, or an average of a little over 1000 tons each, while the 13 manganese mines yielded only 2667 tons, and the rest of or of lead mines but 3000 tons. Now, as it is very well known that in each of these cases the immense bulk of the produce came from two or three mines at the most; it is very evident that the operations at the great majority must have been merely nominal. The produce of tin and copper and arsenic is spread over a wide area, and there the disproportion is not so great; but there are certainly somewhere about fourscore mines set down which are either mere names, or very little more, in Cornwall; and as to Devon, the number of metalliferous mines in active operation cannot much, if at all, exceed 30.

Dr. Foster continues his raid on those who are responsible for unprotected mine shafts. At Helston, on Saturday, Mr. Charles Trelawny was summoned for having on his land in the parish of Breage several unprotected mine shafts. Dr. Foster said that as long ago as Feb. 5 last he wrote to Messrs. Stephens, France, and Jago, of Plymouth, Those gentlemen replied almost immediately that they had instructed Capt. Josiah Thomas, the agent of Mr. Trelawny, to attend to the work if the mine sett was not under grant. There were, in all, seven shafts, one in proximity to a public footpath, with a cottage within 30 yards. On June 2 they were still unfenced, and the summons was issued. Some of the shafts had no burrow to protect them, and the mouths were flush with the ground. Mr. William Tacke, Inspector of Nuisances, said he knew the shafts, and, as far back as February, 1875, he called the attention of Mr. Trelawny's stewards to their condition. One was within 9 ft. of the road, and a cottage where there were children was within 20 feet. Capt. Thomas said he was mineral agent of Mr. Trelawny, and a year and a half since had instructions to fence all the old shafts at Wheal Vor; 39 had been secured, and he understood that the shafts in question were in enclosed land, and not unprotected. He knew of no path being there. He should himself pay any fine that was inflicted, as it was not Mr. Trelawny's fault. Mr. J. J. Rogers chairman, said the case was more one of inadvertence than wilful neglect, but the Bench felt that these cases were too numerous, and it was not enough that the work was attended to after summonses were issued. A fine of 5*l.* and costs would be inflicted. This case was evidently, as Mr. Rogers said, one of inadvertence, but the evil is that these inadvertencies have kept the Inspector from attending to more important matters.

Far more serious was the business to which Dr. Foster had to attend on Saturday, when an inquest was held on the bodies of two men named Old and Rowling, who were killed by a barrel falling on them in the shaft at Coombellack. The cause of the accident was a singular one. The rope with which the kibble was being hoisted caught fire—it was at first thought through friction, but it would now seem in consequence of a spark from the engine. The nature of the occurrence was clearly explained at the inquest by a young man named Date, who was working with Old and Rowling, hearing the boiler 42 fms. from surface at the time. Hearing a warning overhead he looked up and saw the barrel coming, and leaped to the other end of the shaft. Next he saw the two men under the timber, rope, &c., which had fallen down the shaft. He went up the ladder 2 fms. above, into the level, and rang to surface for assistance, and went below again to his dead comrades. Rowling was near the bottom of the ladder, quite dead. Wounds in his head and body caused death. John Old was also dead. His head was cut open behind. The barrel, chain, and rope were all at the bottom of the shaft, near the men, and the barrel probably struck Old. When they worked far down there should be a penthouse overhead if the shaft communicates with the upper air. If they had been working under a penthouse the men would, probably, not have been killed. Had been sinking in this shaft six months. Stones had fallen out of the kibble—none very large. Generally stood under the engine-shaft, part of the same shaft which was divided from top to bottom. Did not go into the plat while the kibble was going up; they were too far down. Heard that Rowling had been injured there six months since by stones falling down on him. The kibble then hitched and partly upset.

Other witnesses were called, but nobody could tell how the rope caught on fire, and the only further material evidence was as to the duty of providing a penthouse. Capt. Nancarrow, the manager, said he considered the engine-shaft equivalent to a penthouse, because a cistern covered one-half and the ladder "sollar" a good deal of the rest, but the whim-shaft was open. Did not consider there was any danger to the men, neither did he think a penthouse necessary. Heard of Rowling's former accident. The men never complained. It would be safer if the men were under a penthouse, and it was his (witness's) duty to protect the men as much as possible. Would not put a man where he himself would not work. Did not know of any man complaining to him about the danger, but they had about want of casing, and then he had brought it down. Some of the witnesses, however, said there had been talk about the danger, and, further, that it was the custom for the men to ride up in the kibble, and the jury, after deliberation, announced that they were unanimous in finding a verdict of "Manslaughter" against Capt. Nancarrow, the manager of the mine. Capt. Nancarrow received the decision with great surprise. He was then, on the warrant of the Coroner, committed for trial at the assizes. Bail for his appearance was accepted. This is the first time under the Act any local inquiry has had so serious a termination.

The valuable work by M. Moissonet—"Observations on the Rich Parts of the Lodes of Cornwall"—which has been translated by Mr. J. H. Collins, F.G.S., will soon be published. Mr. Collins has undertaken the task of translation with the sanction and concurrence of the author, who has, moreover, added to his work several original notes. As the edition is limited to 400 copies, and the work will contain many valuable plates and diagrams, it is very desirable that those who wish to secure a copy should take time by the forelock, and place themselves on the list of subscribers, which already con-

tains the most eminent names in the mineralogical world, and an important body of those interested in practical mining, for the book is at once thoroughly scientific and thoroughly practical.

#### REPORT FROM THE NORTH OF ENGLAND.

June 21.—In reference to the Pig-Iron Trade of the North of England there has been little to report during the past few days. The amount of business done is undoubtedly large, all but a small proportion of the 180,000 tons being now produced every month going into consumption in one form or another. But prices are extremely unremunerative. Makers say it is quite impossible to produce iron at a profit, and all the attendant conditions of the trade appear to justify this conclusion, notwithstanding the reductions that have recently been made in the wages of miners and blast-furnace men throughout the district. On Tuesday pig-iron was quoted at Mid-  
dleborough Exchange from 3*d.* to 6*d.* per ton less than the figure for the previous week. The price ordinarily quoted for No. 3 is now 4*l.* 6*d.*, but in some cases sales have been made at a lower figure. In most respects the condition of the trade is quite the same as it was a week ago.

Messrs. Bolekew, Vaughan, and Co., have just blown in two of their new furnaces at their Eston Steelworks. The furnaces are 74 ft. high and 23 ft. bosh. They are each capable of producing about 400 tons of pig-iron per week. The company do not intend in the meantime to make steel ingots, and hence they are not hastening the completion of their steelworks. They do, however, intend to make Bessemer pig-iron, and sell it to continental steel manufacturers, and for this purpose they have accumulated a stock of over 100,000 tons of hematite ore from their mines in Spain. The works are admirably situated and well laid out. It is expected that they will, when finished, afford employment to over 1000 hands.

The recent award of the umpire appointed to deal with the question of wages in the ironstone mining district of Cleveland has given much dissatisfaction to the miners. At North Skelton a number of the hands have struck work, but this error is likely to be repaired through the mediation of the Executive, who are urging that however arbitration may result, the men, after having once consented to abide by it, cannot be justified in running away from their bargain. At all the other mines in the district the men continue to work, and average quantities of stone are being got out.

The Coke Trade is just a little disturbed by the pending proceedings relative to the wages of the cokemen. The Court formed to deal with this question will assemble at Newcastle to-morrow. Sir James F. Stephen sitting as umpire. The duration of the proceedings will be limited to two days. The issue to be determined is whether there are any special circumstances that should entitle cokemen to either a greater or a less reduction than the 6 per cent. accepted by other surface labour about the Durham Collieries. It appears that the decision will affect the status of the cokemen for the time to come, and as they consider themselves superior to other surface labour they attach a great deal of importance to the impending award.

The Finished Iron manufacturers in the North of England have given notice of their intention to apply for a reduction of 10 per cent. in the wages of millmen and puddlers. The wages of these men have not been disturbed since the beginning of last year, when Mr. Mundella, M.P., and Mr. Edward Williams awarded a reduction of 7½ per cent. Since then the trade has undoubtedly gone from bad to worse, the production of rails alone having fallen from nearly 30,000 tons to some 7000 tons per quarter, while prices have also largely fallen off. The men are proposing to continue the present arrangement for six months longer, but in the seriously depressed condition of the trade it is hardly likely that any such proposal will be accepted. The matter will, however, be referred to the Court of Arbitration appointed to deal with such matters in the finished iron trade. No new orders of any consequence have recently been placed in the Cleveland district, and many of the mills and forges are absolutely starving for work. Prices are cut as fine as they can be, and still North of England makers find it extremely difficult to enter into successful competition with the South Wales district.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

June 21.—The Finished Iron Trade is still very languid. And the recent unfavourable reports of limited ironmaking concerns have had anything but an encouraging influence upon the market. They have, however, tended to strengthen prices here and there, ironmasters declaring that they will not continue to take orders at a loss. District engineering firms and such like people are just now the principal customers. Foreign orders are increasingly scarce. The new business at the mills and forges is mainly upon tank, and boiler and girder plates, angles, strips, and the general run of sheets; 8*l.* will still secure a ton of galvanising sheets. Tank sheets cut to sizes are selling at a little over 8*l.* The demand for pig-iron is very limited, yet stocks in buyers' hands are large. The production is much in excess of requirements, and there are reports that two more furnaces will be blown out at the end of the quarter—one at Pensnett and another at Dudley, belonging to firms who have hitherto commanded a good market for most of their makes; 4*l.* 5*s.* to 4*l.* 10*s.* is still quoted for all-mine hot-blast qualities, but considerable underselling exists. The iron of other districts stoutly competes with the Staffordshire product. Ironstone, even of a high quality, is plentiful. The best Robins Ironstone is selling at 17*s.* and 16*s.* Some holders, however, quote 18*s.* Coal is not in greater demand either as to furnace or forge sorts. The trade is now very unprofitable, and although many of the colliery owners in the Thin coal district have got their colliers to accept lower wages, yet they themselves are not benefited, for consumers demand that the difference should be almost entirely in their favour. Large collieries are standing from want of demand. The Sandwell Park Company have notified ironmasters that they are prepared to supply them with fuel by canal at rates which may be obtained on application at the colliery.

A somewhat novel and very good proposal is being made to a few medium and inferior pig-iron makers hereabouts. It comes from certain first-class vendors of blast-furnace requisites, and is that instead of monetary payment their customers should supply them with pigs delivered at the present works' price to the value of the debt. The sellers of the raw materials intend to stock the pigs until they can sell them again at a substantial profit. If the arrangement should be carried out the production of pig iron would be stimulated, as would also the consumption of the raw materials.

On the Stock Exchanges a slight strengthening is manifest in the Sandwell Park Company's shares. Sellers quote 17*l.*, but buyers hold off at 15*l.* 10*s.* No transaction has taken place since my last. Cannock and Huntington and Hamstead property is still falling, the shares of the former being quoted at 3½ *d.*, and of the latter at 3½ *d.* The Spon Lane Colliery remains at 5 *d.*, and sellers of the Pelsall Coal and Iron at 10 *d.* The 20*l.*—14*l.* paid—shares of the Patent Nut and Bolt Company have sold at 7½ *pre.*, and the 20*l.*—half paid—shares of the Patent Shaft Company at 4 *d.*

The arbitrators under the Mines Drainage Act hold two meetings at Wolverhampton to-morrow, when they propose to make a draft award for the Old Hill district, and a similar award for the Bilston district. The rate required in the first district they estimate at 3*l.* per ton for limestone and fire-clay, and 6*d.* per ton for ironstone, coal, slack, &c. In the Bilston district it is proposed to levy the maximum rates on all minerals raised.

In North Staffordshire the condition of the Coal and Iron Trades has not improved. Finished iron orders are scarce, pigs are difficult of sale, the market is overstocked with ironstone, and coal is plentiful, and almost unprofitable.

The depression which has so long characterised the iron trade was fully illustrated on Thursday at the annual meeting of John Bagnall and Sons (Limited), the company which has recently gained a verdict against Messrs. Carlton and Grant. The directors reported that the year's working had resulted in a loss of 14,972*l.* 16*s.* 5*d.* The Chairman (Mr. Edward Gem), in moving the adoption of the report, attributed the loss to the depression of trade, fall of iron,

and consequent depreciation in stock, short hours of labour, and foreign competition. He believed almost every ironworks and colliery in the kingdom had been a victim to the bad state of affairs, which he attributed to the bad advice given to the working classes. The depressed state of trade was, he believed, in a great measure due to the rash counsel of such gentlemen as Mr. Macdonald. Many orders executed by Belgian manufacturers would have been given to English could the latter have accepted them without inserting a "strike clause." Mr. Macdonald's statement that England was not suffering from competition was, he thought, refuted by the fact that orders were now going to Germany. The company had received from one of its former customers a letter stating—"We can buy iron bars from Germany at 6*l.* 10*s.*, whereas your list shows 9*s.* 10*s.*" Others speakers confirmed the remarks of the Chairman, and the report was adopted.

**THE DARLSTON STEEL AND IRON COMPANY.**—Three meetings of shareholders, creditors, and debenture-holders of this company were held, on Tuesday, at the Great Western Hotel, Birmingham, by order of the Master of the Rolls, for the purpose of ascertaining the views of the various parties with reference to the proposed reconstruction scheme. Mr. A. E. Wenham, in his capacity of official liquidator, presided. The new scheme has already been approved at a meeting of the company. The new company is to be incorporated under the name of the Darlston Coal and Iron Company (Limited), with a capital of 150,000*l.*, divided into 15,000 shares of 10*l.* each. Debentures of the new company are to be issued in the principal of the existing debenture-holders, bearing interest at 5 per cent. At each of the meetings it was resolved: "That the meeting approves of the arrangements embodied in the heads of the proposed reconstruction scheme now submitted to the meeting and signed by the Chairman, and requests and authorises the Chairman to take such steps as he may be advised to be necessary or desirable for carrying out the same in its present form, or to such modifications or alterations as the committee may deem just."

#### REPORT FROM DERBYSHIRE AND YORKSHIRE.

June 21.—Business is far from being good in Derbyshire, and there are just now more complaints than usual as to the quietness which prevails in both mining and manufacturing. At the lead mines the men are working steadily, but the production is far below what it ought to be, and there appears to be no spirit of speculation the same as we find in most other lead districts. Mining officials, as well as owners, do not set themselves out for forming companies for the taking of concerns that do not pay, but which could probably be floated by alluring prospectuses, and flaming reports from managers that can always be purchased. There are, however, mines now standing that there is very little doubt could be made to pay by ordinary perseverance, application, and the necessary capital. The collieries have not been so well employed as they were, and at several of them the men are employed little more than half time, whilst several small concerns are not working to a profit. From some places the trade with London keeps up very well for the season, but the consumption has fallen off considerably since the warm weather set in. Steam coal, however, is in rather better request.

The North Wingfield Colliery Company have reached the "Ell coal" at their colliery near to Chesterfield, and have found it to be 5 ft. 3 in. thick, although at the other colliery in that locality where the same seam is being worked it varies from 2 ft. 3 in. to 2 ft. 10 in. The bed is the same as that worked at Grassmoor, and is of good quality. At Mr. Holdsworth's colliery adjoining, however, the seam is 3 ft. 6 in., and increases in thickness until it reaches the new shaft of the Whittington Company.

Very little alteration has taken place in the Iron and Steel Trades of Derbyshire, but with regard to the former in particular there is plenty of room for improvement. The production of pig goes on much as usual, but the demand is quiet. Some of the foundries are doing tolerably well, but the trade is what may be termed as very uneven.

In Sheffield some few houses are rather better off, but the great majority are in the same state as they have been for some months past. The ordinary ship and plate mills are the reverse of active, and there is no push with respect to any of the others. Some of the crucible steel makers are a little busier, and for some descriptions of goods for the colonies more is being done. The principal business done in the best qualities of table cutlery is for the home markets, for American orders are still few and small. The foundries are not so busy as they were a few months ago, but the makers of malleable iron and castings have been doing tolerably well. The collieries in the district are not doing quite so much, except in steam coal, and there is every probability of less being done. Two or three of them sending to the Metropolis up to now have been doing tolerably well, but even their prices have recently come down 1*s.* per ton, and in all likelihood will be still lower. In other parts of the South Yorkshire district trade is very dull, and at one large foundry for the first time the men have been put on short time, and several discharged. Bessemer steel, too, is not in such good request as it was earlier in the year. At Carlton, and several other places, men are busily engaged in opening out the coal, so that before very long we shall be in a position to return some hundreds of thousands of tons yearly more than we are at the present time. Just now, with some thousands of miners on strike in the country, and many working short time, a much larger quantity of coal is being raised than markets can be found for. What it will be in a few months more, should all be at work, with the vast increase in the production, it is not easy to say. One thing, however, is evident, that there is little probability even of the present price of coal being maintained, and no doubt wages will follow in the same direction.

#### REPORT FROM MONMOUTHSHIRE AND SOUTH WALES.

June 21.—There is little or no change to be noted in the Iron Trade, and although clearances are well maintained prices continue very low for finished descriptions. The Belgians can make common iron bars much cheaper than they can be manufactured in this district, and consequently many of the orders which should come here go to Belgium. At the same time this district gets a good share of what orders are placed in England. For rails there is still a fair demand at, however, almost unremunerative rates. Pig-iron is still selling at prices in favour of buyers. Clearances of iron have been well maintained during the week, and have been to the Baltic ports, Canada, India, and Newfoundland, as well as a large parcel to Cadiz. Tin-plates show a little more animation, and in some instances slightly enhanced prices have been obtained. Shipments have been made to France during the last few days. With the restriction in make, and considering that several establishments are closed, there is a probability of an improvement.

In the Coal Trade the main topic of conversation has been the crisis which is impending. Colliery proprietors naturally feel strongly on the matter, as by the course taken by the Committee of Control of the Aberdare and Plymouth Company they are placed at a great disadvantage. While this company can sell coal at 10 per cent. less than they are bound down by the sliding scale to pay the minimum wages under the award, which they cannot terminate except by giving six months' notice. It is contemplated, therefore, to give this notice, but then it will be six months before coalowners can compete with the company named, and the other companies who have followed its example. It is feared that the Masters' Association—a powerful and influential organisation—will be broken up. The Association requested a deputation, consisting of its Chairman, Sir George Elliot, M.P.; Mr. D. Davies, M.P.; and Mr. Dixon, to wait upon the syndicate of bankers who control the company, but the latter have declined to receive it. Thus matters stand. The colliers in the employ of the company view with satisfaction the fact that they have enlisted on their side the sympathies of such gentlemen as those above named, and some of them are desirous of giving notice to terminate contracts; no doubt if they do so they will be thrown out of work. The syndicate, it is contended, are not members of the Association, as Mr. Fothergill's right to sit on the Association did not pass to them. Meanwhile the colliers in



the district are holding meetings, and in several instances have resolved to assist their fellow-workman if they resist the reduction. To some extent the men in the Ogmore Valley, who are on strike against a reduction of 10 per cent., have been assisted. The foreign demand for coal has been well sustained during the week; in fact, shipments have slightly increased. House coals are very quiet, but there is a little more business doing in patent fuel. A trial of a patent apparatus for utilising anthracite coal has recently taken place on board the Balmoral steamer from Swansea, which demonstrates the value of this coal as fuel for marine boilers. It was proved that the use of the coal not only ensures a quick passage, but that the saving in quantity used was great, compared with other coal. The smokeless character of the fuel is also valuable, as it might probably be used with advantage on board ships of war. Further experiments by the patentees will take place.

The flooding of the Lower Tir Phillins Colliery, Pontllanfraith, the property of Messrs. W. and H. Powell, is announced. A sudden influx of water occurred in the workings where the men were driving a hard heading. The water has gained rapidly, and although pumping has been resorted to it does not abate. About 150 men and boys are thrown out of employment by this mishap. It is believed that the water from the Sirhowy river is finding its way in through a fault.

The case of Mr. Benjamin Thomas, underground manager at the Weigfach Colliery, to which I alluded last week, has been re-heard. He was fined £20. In March last, it will be remembered, 18 men lost their lives in this pit. At a meeting of colliers (employed at the pit, and another one under defendant's care), held on Saturday, the men expressed their confidence in Mr. Thomas, and passed a resolution to the effect that they considered he had performed his duties carefully and efficiently, and regretted that proceedings should be taken against him.

Some time ago the sale of the Cwmavon Works, Glamorganshire, was announced in these columns. Steps are being taken to subdivide the huge concern into three or four establishments, and it is hoped that some of the old employees will again be engaged. Messrs. Shaw and Thompson, both well-known metal brokers of London, are acting on behalf of the purchasers.

#### TRADE OF THE TYNE AND WEAR.

June 21.—The coal and iron works have been well employed of late, and the shipments of the staple products of the district—coal, coke, pig-iron, chemicals, &c.—have been considerable. Looking at this, and also at the large mineral traffic on the North-Eastern Railway, it would hardly be considered that the times are so bad as generally represented. Competition, however, is very close, and it is evident that any increase in the demand will cause increased output of coal immediately from pits which have only been stopped until better times arrive. So long as this continues, only works favourably situated can earn any profits of consequence. The Alexandra Pit, a large new work belonging to the Earl of Durham, has been re-started after having been stopped some time. All the Northumberland collieries have been worked pretty regularly since the termination of the strike, and most of the works in Durham have also been well employed. It is remarkable that there appears to be no dread whatever of the war in the East at present; that feeling has almost entirely passed away as it is considered that there is no danger of its spreading to any other nations except the present combatants. The close of the war, however, would be hailed with much satisfaction, as this would no doubt give an impetus to the coal and iron and chemical trades. The advance in chemicals has been well sustained, and shipments have continued steady, stocks are not large, so that good employment is expected in most branches of this trade.

The Iron Trade is generally described as extremely dull, but the make is very large, and it is not pretended that stocks are accumulating. A good business is done, with exactly the same results as those referred to in the coal trade, and only those works favourably situated as to position, and those who produce their own materials, as coke, &c., can make profits of any consequence. It is clear that either the demand must still further increase to a considerable extent, or some furnace must be blown out to bring the business into a healthy state. The pig-iron sold for the last half-year will, it is expected, exceed by 30,000 tons the quantity sold in the first half of 1876. The Spanish ore trade is becoming an important one here; steamers and sailing vessels are glad of a return cargo from the coast of Spain. This ore, which is of high quality, is partly consumed here, but considerable quantities are sent to Sheffield and other districts for the manufacture of Bessemer steel. Iron ship-building continues very brisk, and founders are also very busy.

A special meeting of members of the North of England Institute of Mining and Mechanical Engineers was held on Saturday, the main object of which was the consideration of the proposed alteration of the rules by the formation of a new class of members. It had been originally suggested that the members should be divided into fellows, members, honorary members, and students, but an amendment was carried by a large majority that the titles of the classes be members, associates, honorary members, and students—the alteration to be prospective, and not to affect existing members. A paper was then read by Prof. A. S. Herschell on "A New Hand Gear, assisted by Steam, for Starting and Reversing Windmill-Engines, used in Belgium." The paper was the result of observations during a late visit to Belgium. A hearty vote of thanks was passed to the author of the paper.

NEWCASTLE COLLEGE OF PHYSICAL SCIENCE.—A meeting of the governors and friends of this college was held in Newcastle on Friday to hear the result of the terminal examinations, and to distribute the prizes. There was a large attendance of ladies and gentlemen. An address of a very interesting and suggestive kind was made to the students and those assembled by the Dean of Durham. It appears that some of the students have made good progress, and have distinguished themselves, but that the honors obtained are confined to a comparatively small number, and that the bulk of the students have hardly made satisfactory progress, the main reason assigned being that when they go to the college they have not been sufficiently prepared for the teaching of the professors by the school masters. The Dean remarked strongly upon this point, which is, of course, very important. He also pointed out that at some future period the students at the college should, after spending two years there, be in a position to proceed to some of the universities for the purpose of further culture in the arts and sciences. Mr. R. Can Ellison, in seconding the motion, made the remark, which is worthy of notice, that he hoped that the future generation of managers of factories and collieries would be able to utilise the waste products of the works. This process has already been commenced, but it is highly desirable that it should be carried out without delay. The great bulk of these products can be converted to useful purposes, such as bricks and road material, &c., and thus the landscape will not be obscured. Much valuable land will be saved for husbandry purposes, and the result will also be very great economy in the carrying on of the works.

CHEMICALS, MINERALS, AND METALS.—Messrs. J. Berger Spence and Co. (June 16).—Acetate of Lime, 9s. 10s. per ton.—Alumina: Alum, 6s. 15s. for loose lump; ground, 7s. 15s.—Ammonia cake, 4s. 10s.—Ammonia: Sulphate, grey, 12s. 5s.; best London white, 19s. 10s.; muriate, white, 27s.; sal ammoniac, firsts, 45s.; seconds, 44s.—Acid: Tartaric, English, ground or crystal, 1s. 5s.; foreign, 1s. 4s.; crystals, oxalic, 5d.; sulphuric, 3s. 10s. to 3s. 15s.; picric acid, 1s. 6s.; peroxide of Arsenic, New Consols make 3s. 10s.—Bleaching Powder, At 5s. 5s.; for the whole of the year 1877, 6s.—Litharge: Best flake, 24s.—Metallic Salts: Iron salts, green and rusty copperas, 55s.; in casks or barrels, 60s.—Copper Salts: Sulphate of copper, 22s. 15s.—Magnesia: Epsom salts, 3s. 5s.—Nitrate of Soda: 1s. 6d. to 1s. 9d.—Potash: Magnesia, 80 per cent., at 6s. 5d. f.o.b.; Prussiate, yellow, 10s. 4d.; chloride, 9d.; bichloride, 4s. 4d.—Soda: Cream caustic, 60 per cent., 11s. 7s. 5d.; white, 80 per cent., 12s. 7s. 5d.; soda ash, 13s. 4d. to 13s. 5d.; soda crystals, 4s. 5s.; carbonate, 11s.; salt cake, 2s. 15s.; Glauber salts, 2s. 15s.—Sugar of Lead: Brown, 2s.; grey, 3s. 10s.; white, 3s. 7s.—Brimstone: Best third, 5s. 7s. 6d.—China-clay: 15s. f.o.b. Cornwall; "Rosemellyn," 24s.; "B.M.," 34s.—Iron Ore: Hematite, 15s. to 22s. 6d.; Algerian, 5s. per cent., 14s. f.o.b.—Manganese: Ores, 90s. for 70 per cent.—Pyrites: Spanish cupreous, 5s. 4d.; non-cupreous, 6s. 4d.—Phosphate of Alumina, 3s. to 3s. 10s. per ton.—Phosphates: High strength, 80 to 85 per cent., 1s. 4d. to 1s. 5d. per unit; Estremadura, 1s. 3d.; ordinary, 60 per cent., 1s.; precipitated phosphate of lime, 70 per cent., 5s. 15s.—Iron: Middleborough Pig-iron, No. 1, 47s. 6d.; No. 2, 45s. 6d.; No. 3 (foundry), 41s. 6d.; No. 4 (forge), 41s. net.—Hematite, No. 1, 70s.; No. 2, 67s. 5d.; No. 3, 64s. 5d.; No. 4, 61s. 5d.;

No. 5 (mottled and white), 64s. 6d.—Bessemer, No. 1, 70s.; No. 2, 67s. 5d.; No. 3, 65s.; less 2s. p.c.—Scotch warrants, 55s. 9d.; Scotch, g.m.b., No. 1, 55s. 6d.; No. 2, 52s. net.—Copper: Chili bars, 68s.; B.S. ingot, 79s.; tough cake, 77s.—Lead: Best English soft pig, 21s. 5s.; German soft pig, 21s. 5d.; Liverpool or London—Spelter: Silesian, 20s. 10s.; English, 20s. 5s. on rail, makers' warrants—Tin: S. rails, 85s.; Australian, 92s.; British, 7s. 7d.—Tin-Plates: Best charcoal, 28s.; charcoal, 25s.; best coke, 23s.; coke, 22s.—Tubes and Fittings: 75 to 77½ per cent.

WEST PATELEY BRIDGE (Lead).—The Craven Cross vein in the 55 is steadily improving as it approaches the ran of rich ore ground gone down in the bottom of the old surface workings; the vein is over 5 ft. wide, composed of barytes and spar, intermixed with patches of lead ore. The branch of the North Rake vein, in the level east of cross-cut from No. 2 shaft, has improved during the last few days; it is now more than 1 ft. wide, carrying a leader of lead ore, worth fully 5 cwt. per fathom; in the level west of shaft the lode is 2 ft. wide, worth 10 cwt. of lead ore per fathom. The Discovery lode in the new shaft is between 2 and 3 ft. wide, producing 15 cwt. of lead ore per fathom, and promising for further improvement. The various other lodes maintain their former productiveness.

HULTAFALL MINING COMPANY.—A company under the above title has just been registered for the working of an immense deposit of mineral adjoining the Vieille Montagne Company's mines, in Sweden, which are now annually returning the largest quantity of blende and lead of any mines at present being worked. The Hultafall Mines have been inspected by Capt. Southey, of West Chiverton, whose report appears in our issue of this day. Capt. Southey values the lode in the bottom of the shaft at 150l. per fathom net for blende and lead, and on an output of only 40 tons per day, and with one crusher at work he estimates the profit at 3800l. per month, to be increased of course as the property is opened and the dressing-floors extended. The country rock is granite, similar to those of the Vieille Montagne, which have been working prosperously for 20 years past, and are now only about 50 fms. in depth. The deepest part of the Hultafall Mines is a little over 10 fms. in depth, and the lode has maintained an almost uniform size and character from the surface downwards. The company is divided into 12,000 shares of 5l. each, and with the practical management under which it is started we augur for it a brilliant future.

ST. HARMON LEAD MINING COMPANY.—At the second general meeting of shareholders, held at the offices on Thursday (particulars of which appear in another column), the directors' report and statement of accounts were received, and unanimously adopted. Mr. Kitts supplemented his report by pointing out on a copy of one of the plans recently distributed amongst the shareholders the various points of interest, also indicating in a similar manner the large amount of valuable work that has been executed since he was placed in charge of the mine. He further stated that the lode in the 35 fm. level west had improved since his report, and was now yielding good lead; also that he was perfectly satisfied with the result of the work done during the year, and that the capital of the company was, in accordance with his original estimate, fully equal to the work to be done in order to open out and develop a great mine—in fact, such as he quite believed and trusted this property would prove to be. A cordial vote of thanks to the directors and Mr. Kitts closed the proceedings.

BENHAR COAL COMPANY—DEFECTIVE MACHINERY.—At Glasgow, on Wednesday, John Murray, aged 16, was employed at the Benhar Coal Company's pits to attend to and brake wagons on an inclined plane; but the momentum often overcame the brake, and he had to stop them by spragging the wheels with any wood at hand. In January, 1876, a sprag, a bit of paling rail, broke, the lad stumbled over the fragments, fell, and the wagon passed over and nearly severed his leg a little above the knee. The pursuer claimed 1000l. damages, attributing the accident to the company's neglect to provide proper machinery to stop the wagons. When evidence had been partly led, the defenders agreed to pay 250l. and expenses, which being accepted the case was stopped.

BRYN ALYN LEAD MINE (North Wales).—The discovery of lead ore made at this mine last week in the stopes over the 60 continues to improve. A vein of solid ore, 1 ft. in width, has been driven into for ten days, and the ore increases in quantity as the driving goes on, and a splendid deposit is left both in the roof and in the bottom of the level. Good ore was met with for 50 yards in this stopes previous to this discovery. The 100 east is in a fine lode, 4 ft. wide, producing nice lumps of ore, and in a few days more driving it is expected that another valuable deposit of lead ore will be laid open in this level, even better than in the stopes. This mine is rapidly improving.

WEST CRAVEN MOOR.—The prospects of this property continue to improve; we hear another 20 tons of lead ore is being got ready for the smelt mills. They are opening up a rich mine, as the reports prove. The workings are shallow, but as far as seen the ore ground holds down to a great depth. They have a splendid lode in the Blackhill adit, and thus far have passed through it 17 fms., rich for lead all the way.

COMBARTON MINE.—An important improvement has taken place during the past week. The part of the lode which was left standing by the former workers in the 37 has been taken down, and the level is now being driven into untried ground, where the lode is worth fully 10 cwt. of silver-lead per fathom. The manager pronounced it to be the best lode he has ever seen in the mine, and it is the more important seeing that it is going into undeveloped ground which can be worked without the aid of any other machinery than a horse-whim. Some fine specimens of the ore have been received at the London office of the mine.

FRONTINO AND BOLIVIA.—All must admit that this company well deserves the great success it is beginning to realise. Three years since, after having raised upon debentures 13,000l., the company were without funds, and the shareholders disinclined to subscribe further capital. Messrs. Restrepo and Sons (the company's bankers in Bolivia) advanced about 5000l. on the mortgage of the mines, and immediately employed Mr. R. R. White, the present manager. Since that period Mr. White has paid out of the profits of the mines not only the 5000l. due to the local bankers, and the debenture debt on this side, but to pay a dividend to the shareholders. When the revolution broke out in June, 1876—a monthly profit of about 1200l. was being realised; and, according to well-authenticated private information, such results may be shortly looked for as to place these mines, after a chequered career of 20 years, in that enviable position so confidently expected by their earliest supporters.

GOLD IN RUSSIA.—In a recent work by M. Bogolubsky on Gold and Gold Mining in Russia, it is stated that the area of the gold mines in that country is a little over two millions of square miles. The yield is about 80,000 lbs. in weight annually, this being equivalent to 3,000,000 sterling on an average. After deducting working expenses, this does not leave a very large sum for so large a tract of land.

#### TO METAL MERCHANTS.

FACTORY TO LET, WITH GOOD FURNACES, KERBEY STREET, POPLAR. Apply to W. H. BASDEN, 93, Cannon street, London, E.C.

WILLIAM FRANCIS, M. and C.E., 2, DERWEN VILLAS, MOLD. Over Twenty-five years' experience. Pupils received for a Course of Instruction in Surveying, Dialling, Levelling, Geology and Mineralogy—their practical application to the various branches of Metalliferous Mining, Quarrying, &c. Terms on application.

INVESTMENTS.—THE BEST FOR LARGE OR SMALL SUMS. Profits last account vary from 35 to 100 per cent. on outlay. Like results may be relied on for June account by acting in one or two active stocks. Apply for list and particulars. Enclose stamp. HUME AND CO., CROSBY HALL CHAMBERS, LONDON, E.C.

MESSRS. J. TAYLOR AND CO., MINING ENGINEERS AND INSPECTORS. 82, LONDON WALL, LONDON, E.C. Have Agents in England, Scotland, Wales, and on the Continent.

MESSRS. THORNYCROFT AND CO. FINANCIAL AGENTS AND SHARE BROKERS. 61, SOUTH JOHN STREET, LIVERPOOL.

#### REDUCTION OFFICER.

WANTED, TO PROCEED TO CENTRAL AMERICA, on the FERROUS ORES. Must have had at least two or three years' practical experience on a Gold Mine. Copies of testimonials as to character and ability may be addressed "R.," care of Mr. G. Street, Advertising Offices, 30, Cornhill, E.C.

#### SECRETARY WANTED.

WANTED, A GENTLEMAN, TO TAKE THE SECRETARYSHIP of a LIMITED COMPANY. One who could put some money in the Mine, or place Shares, &c. The mine is situated in the richest district in Cornwall for Tin and Copper, and the mine is opening rich. For particulars, address to "B.," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

WANTED.—THE ADVERTISER, an ASSAYER, last employed as Chemist and Manager in a Spelter works, DESIRES an ENGAGEMENT. Has had experience of the extraction of gold, silver, and lead from ores; also would not object to go abroad. Speaks Spanish. Highest references. Address, Mr. THOMAS BOWEN, Penrith, near Derby.

#### TO IRON AND TIN-PLATE MANUFACTURERS.

WANTED, by a Firm well-known in Liverpool, and having a good connection, an AGENT for a GOOD MAKE of TIN-PLATES and MANUFACTURED IRON. Willing to make advances if required. Address, "Metal," care of Messrs. Harvey, Alsop, and Stevens, Solicitors, Liverpool.

#### TO MINING COMPANIES.

WANTED, A SITUATION as CLERK, by a Young Man, who is also able to dial, and keep up the plans of a mine. Good references. Address, "M.," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

WANTED, for a Lead and Copper Mine in active operation, situated in Wales, a PRACTICAL MAN as FOREMAN DRESSER and SURFACE MANAGER. Must be thoroughly acquainted with dressing machinery, and the manipulation of mixed ores. Address, "T. B. P.," Post Office, Carnarvon, North Wales.

WANTED, for an extensive COLLIERY, turning 6000 tons weekly, a GOOD COMMERCIAL MANAGER. One thoroughly acquainted with the duties of such an appointment, and of long experience and competency. Address, with testimonials, full particulars of former employment, and salary required, to "O. G.," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

WANTED, TO PURCHASE, CALC-SPAR, of superior quality. Apply, HOWARD THOMAS, Harford-street, Birmingham.

TO ASSAYERS, CHEMICAL MANUFACTURERS, &c. A GERMAN GENTLEMAN, Dr. PH., of great practical experience, IS OPEN TO ACCEPT AN ENGAGEMENT in any branch of the above. Highest testimonials. Letters to be addressed "Dr. B.," care of E. Schubert, Esq., 32, St. Swinburn Lane, London, E.C.

#### TO IRON ORE MERCHANTS, AND OTHERS.

A GENTLEMAN, residing in South Wales, IS OPEN TO SELL IRON ORES, on commission. Has a very valuable connection with the iron and steel producers, and is capable of pushing business. Can produce excellent references. Address, "Iron Ore," MINING JOURNAL Office, 26, Fleet-street, London, E.C.

A METALLURGICAL CHEMIST, who is practically acquainted with Extraction of Metals by Wet and Dry Processes, and who could undertake the Erection of New Works, wishes to MEET with a SITUATION, either in this country or abroad. Highest references. Address, "S. D.," care of W. H. Smith and Son, Castle street, Liverpool.

MR AD DE KATOW, CIVIL AND MINING ENGINEER, 44, BLURTON ROAD, CLAPTON PARK, E., has now OPENED an OFFICE at 94, GRACECHURCH STREET, E.C. Surveys, designs, plans, specifications, &c., and superintendence of all works connected with the profession promptly attended to on moderate terms. Sale and Purchase of Mining Properties negotiated (several now for disposal presenting unusual advantages). Engineering.

#### TO AGENTS OF MINES, AND OTHERS.

MR. R. PASCOE, MINING ENGINEER, LAND SURVEYOR AND GENERAL DRAUGHTSMAN (Fourteen years with James HENDERSON, Esq., C.E.) Mines surveyed or inspected, and faithfully reported on. Terms moderate. OFFICE—4, ST. MARY'S STREET, TRURO, CORNWALL. A vacancy for a Pupil.

COLONIAL BANK.—Subscribed capital £2,000,000. Paid-up 600,000. Reserve fund 84,000.

The Court of Directors of the COLONIAL BANK hereby give notice that, in pursuance of the provisions of the Charter, a HALF-YEARLY GENERAL MEETING of proprietors will be HELD at the Bank House, No. 13, Bishopsgate-street Within, E.C., on THURSDAY, the 5th July, 1877, at Two o'clock precisely, to receive the report of the proceedings of the Corporation.

The Transfer Books of the Corporation will be closed on the 25th June, and reopened on the 9th July, 1877.

By order of the Court of Directors, JAMES CLARK, Secretary. 13, Bishopsgate-street Within, E.C., 7th June, 1877.

ST. JOHN DEL REY MINING COMPANY (LIMITED). Notice is hereby given, that the ORDINARY GENERAL MEETING of this company will be HELD at the City Terminus Hotel, Cannon-street, London, on WEDNESDAY, the 27th day of June next, at Two o'clock precisely, to receive and adopt the Directors' Report, and to declare a Dividend.

JOHN HOCKIN, Managing Director. 8, Tokenhouse yard, E.C., 12th June, 1877.

THE ALMADA AND TIRITO CONSOLIDATED SILVER MINING COMPANY (LIMITED). Notice is hereby given, that the FOURTEENTH HALF-YEARLY GENERAL MEETING of the above company will be HELD at 47, Finsbury Circus, London, E.C., on FRIDAY, the 29th day of June, 1877, at Twelve o'clock precisely, for the purpose of receiving reports from the directors and manager, and transacting the ordinary business of the company. The Register of Transfers will be closed from the 15th to the 29th instant, both inclusive.

By order of the Board, H. G. DENNIS, Secretary. No. 47, Finsbury Circus, E.C., the 15th June, 1877.

THE CAPE COPPER MINING COMPANY (LIMITED). Notice is hereby given, that the ORDINARY GENERAL MEETING of the shareholders of this company will be HELD at the Terminus Hotel, Cannon-street, in the City of London, on WEDNESDAY, the 18th day of July next, at Two o'clock in the afternoon, to receive the report and accounts for the year 1876, and for general purposes.

Not conforming with the Articles of Association, two directors—Edmund Alfred Pontifex, Esq., and John Wild, Esq., retire from office at the above meeting, but, being eligible, offer themselves for re-election. The general meeting will have to elect two auditors for the current year, and F. W. Collard, Esq., and Robert Fletcher, Esq., being eligible, offer themselves for re-election.

Notice is also given, that the Transfer Books will be closed from the 4th to the 18th proximo, both days inclusive. By order of the Board, J. C. LEAVER, Secretary. 6, Queen street place, London, 22nd June, 1877.

THE ANGLO-AUSTRALIAN GOLD MINING COMPANY (LIMITED). Notice is hereby given, that the ORDINARY GENERAL MEETING of the Anglo-Australian Gold Mining Company (Limited) will be HELD at the office of the said company, No. 8, Austinfrilars, in the City of London, on MONDAY, the 2nd day of July, 1877, at One o'clock P.M. precisely, for the purpose of confirming the following Special Resolution passed at an Extraordinary General Meeting held on Monday, the 4th day of June, 1877:—

"That the Anglo-Australian Gold Mining Company (Limited) be wound-up voluntarily."

By Order, J. H. MURCHISON, London Manager and Secretary. 8, Austinfrilars, London, E.C., 14th June, 1877.

THE YORKE PENINSULA MINING COMPANY (LIMITED). Notice is hereby given, that the ANNUAL GENERAL MEETING of the Shareholders of the Yorke Peninsula Mining Company (Limited) will be HELD at the City Terminus Hotel, Cannon-street, London, on FRIDAY, the 29th of June next, at half past One o'clock afternoon precisely, for the purpose of transacting the usual business.

And notice is also given, that on the said 29th day of June instant, and immediately after the termination of the business of the Annual General Meeting, a SPECIAL GENERAL MEETING of the holders of Preference Shares of the company will be held at the same place, for the purpose of approving of or otherwise resolving as to the creation and issue of additional Preference Shares by the company.

And notice is hereby further given, that on the said 29th day of June instant, and immediately after the termination of the business of the meeting last above mentioned, a SPECIAL GENERAL MEETING of the Ordinary and Preference Shareholders of the company will be held at the same place, for the purpose of creating additional Preference Shares of the company.

By order of the Directors, C. GRAINGER, Secretary. 1, King's Arms-yard, Moorgate-street, London, 19th June, 1877.







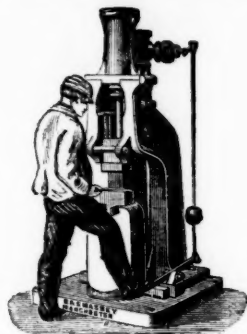
# B. & S. MASSEY, OPENSHAW, MANCHESTER.

Prize Medals—Paris, 1867; Havre, 1868; Highland Society, 1870; Liverpool, 1871; Moscow, 1872; Vienna, 1873; Scientific Industry Society, 1875; Leeds, 1875; Paris, 1875; Manchester and Liverpool Society, 1876; U.S. Centennial, Philadelphia, 1876.

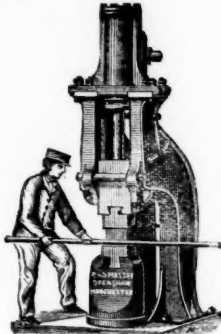
PATENTEES AND MAKERS OF DOUBLE AND SINGLE-ACTING

## STEAM HAMMERS

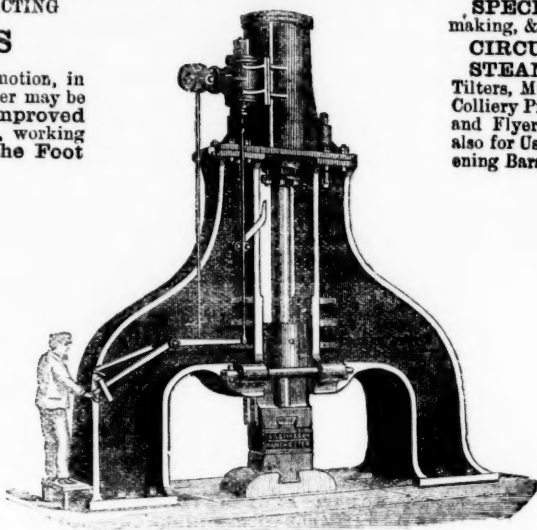
Of all sizes, from  $\frac{1}{2}$  cwt. to 20 tons, with self-acting or hand motion, in either case giving a perfectly DEAD BLOW, while the former may be worked by hand when desired. Large Hammers, with Improved Framing, in Cast or Wrought Iron. Small Hammers, working up to 500 blows per minute, in some cases being worked by the Foot of the Smith, and not requiring any separate Driver.



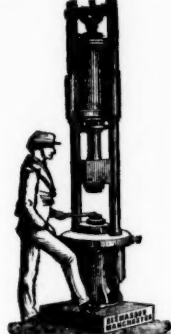
Small Hammer with Foot Motion.



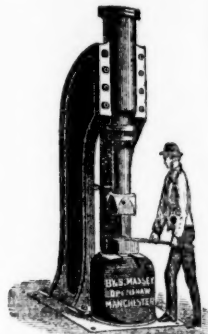
General Smithy Hammer.



Steam Hammer for Heavy Forging.



Special Steam Stamp.



General Smithy Hammer.

SPECIAL STEAM STAMPS, for Forging, Stamping, Punching, Bolt making, &c.

CIRCULAR SAWS for Hot Iron.

STEAM HAMMERS for Engineers, Machinists, Shipbuilders, Steel Tilters, Millwrights, Copper-smiths, Railway Carriage and Wagon Builders, Colliery Proprietors, Ship Smiths, Bolt Makers, Cutlers, File Makers, Spindle and Flyer Makers, Spade Makers, Locomotive and other Wheel Makers, &c. also for Use in Repairing Smithies of Mills and Works of all kinds; for straightening Bars, bending Cranks breaking Pig-iron, &c.

From 60 to 100 Steam Hammers and Steam Stamps may usually be seen in construction at the Works.

## THE "CHAMPION" ROCK BORER

STANDS UNRIVALLED

For Tunnels, Mines, Quarries, Harbour Works, Cutting Blocks of Granite, &c.

The working parts are made of the toughest steel and phosphor-bronze—steel castings are also used—so as to combine strength with light weight.

## AIR-COMPRESSING MACHINERY

Of the simplest and best construction.

Combined Water-pressure Engines and Air-compressors, Giving most excellent results.

Mechanical and Consulting Engineers,

ULLATHORNE AND CO., 63, QUEEN VICTORIA STREET, LONDON, E.C



## BARROWS & STEWART, ENGINEERS, BANBURY,

MANUFACTURE

### PORTABLE Steam Engines

With Gear for Winding, Pumping, and Ore Crushing; also

### Combined Mills and Engines,

WITH OR WITHOUT BOILERS, For Grinding Slag, Sand, Mortar, &c.

PORTABLE STEAM-ENGINE FOR SALE, 25-horse power; also 18 and 14-horse; both with or without pit-winding and pumping gear.

FOR SALE, an 18-horse combined vertical ENGINE, and BOILER.

Also a combined 6-feet PAN MORTAR MILL, and vertical ENGINE, with BOILER.

FOR SALE, a new 6 feet PAN MORTAR MILL, and a good second-hand 6-horse power portable STEAM ENGINE.



## BARROWS & STEWART, Engineers, BANBURY.

## MANCHESTER WIRE WORK.

NEAR VICTORIA STATION, MANCHESTER.

(ESTABLISHED 1799).

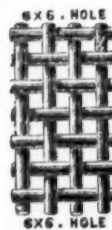
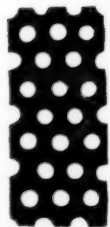
### JOHN STANIAR AND CO.,

Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper.

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES.

Shipping Orders Executed with the Greatest Dispatch.



## THE DARLINGTON WAGON COMPANY

MANUFACTURERS OF

### RAILWAY WAGONS

OF EVERY DESCRIPTION,

For Cash, or on Deferred Payments, or Hire. Repairs executed with Dispatch, on Reasonable Terms.

OFFICES AND WORKS,

ALBERT HILL, DARLINGTON.

### RAILS FOR SALE.

Bridge Section, 10 to 25 lbs. per yard.  
Flange Section, 16 to 70 lbs. per yard.  
DH Section, 50, 60, to 70 lbs. per yard.  
Steel Rails, 30, 36, 54, 58, to 66 lbs. per yard.

NEW PERFECT, NEW DEFECTIVE, AND SECONDHAND IN STOCK.

PERMANENT WAY RAILS, of all sections, made to order.

For sections and price, apply to—

ROBERT WRIGHTSON, NEWPORT, MON.

### SHUNTING.

OVER 3000 OF THE RAILWAY TRUCK AND CARRIAGE SHUNTER now in use.

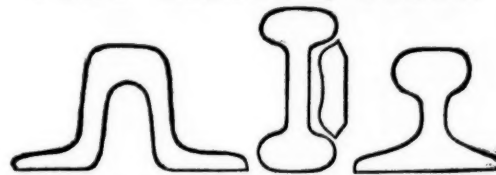
(HESHUYSEN'S PATENT.)

For particulars and Illustrated Price List apply to—

F. G. AND W. FRANCIS,

RAILWAY SHUNTER FACTORY, FOLKESTONE.

JOHN BEATSON, DERBY.



IRON AND STEEL RAILS, of all sections, from 10 to 82 lbs. per yard, new, defective, or second-hand.

POINTS AND CROSSINGS, FISH PLATES, BOLTS, NUTS, CHAIRS, AND SPIKES. LOCOMOTIVE ENGINES AND MACHINERY. MALLEABLE AND PIG-IRON OF ALL KINDS.

Delivered at all Ports and Railway Stations in Great Britain.

A SECONDHAND SIX-WHEELED TANK LOCOMOTIVE FOR SALE.

### ACCIDENTS BY FLOOD AND FIELD.

ACCIDENTS OF ALL KINDS

May be provided against by a Policy of the

RAILWAY PASSENGERS' ASSURANCE COMPANY.

THE OLDEST AND LARGEST ACCIDENTAL ASSURANCE COMPANY.

Hon. A. KINNAIRD, M.P., Chairman.

Subscribed capital, £1,000,000. Annual income, £205,000.

£1,120,000 have been paid as compensation.

A fixed sum in case of death by accident, and a weekly allowance in the event of injury, may be secured at moderate premiums.

Bonus allowed to insurers of five years' standing.

Apply to the Clerks at the Railway Stations, the Local Agents, or—

64, CORNHILL, LONDON. WILLIAM J. VIAN, Secretary.

Second Edition. Just published, price 8s. 6d.

### A NEW GUIDE TO THE IRON TRADE

OR, MILL MANAGERS' AND STOCK TAKERS' ASSISTANT;

Comprising a Series of New and Comprehensive Tables, practically arranged to show at one view the Weight of Iron required to produce Boiler-plates, Sheet-iron, and Flat, Square, and Round Bars, as well as Hoop or Strip Iron of any dimensions. To which is added a variety of Tables for the convenience of Merchants, including a Russian Table.

By JAMES ROSE.

Batman's Hill Ironworks, Bradley, near Bolton.

OPINIONS OF THE PRESS.

"The Tables are plainly laid down, and the information desired can be instantly and accurately obtained."—*Mining Journal*.

"900 copies have been ordered in Wigan alone, and this is but a tithe of those to whom the book should commend itself."—*Wigan Examiner*.

"The work is replete on the subject of underground management."—*M. BATES*, Colliery Proprietor.

To be had on application at the MINING JOURNAL Office, 26, Fleet-street, London.

### THE IRON AND COAL TRADES' REVIEW.

The IRON AND COAL TRADES' REVIEW is extensively circulated amongst the Iron Producers, Manufacturers, and Consumers, Coalowners, &c., in all the iron and coal districts. It is, therefore, one of the leading organs for advertising every description of Iron Manufactures, Machinery, New Inventions, and all matters relating to the Iron, Coal, Hardware, Engineering, and Metal Trades in general.

Office of the Review: 7, Westminster Chambers, S.W.

Remittances payable to W. T. Fringle.



23. 1877.  
ER.  
1875;  
nching, Bolt  
ilders, Steel  
on Builders,  
ers, Spindle  
Makers, &c.  
for straight-  
immer.  
PANY  
Hire.  
e Terms.  
ON.  
E.  
IAND IN  
order.  
N.  
CK AND  
D USE.  
E.  
Y.  
ALE.  
L D.  
PANT.  
the event  
etary.  
DE  
nged to  
et-iron,  
dime-  
chanis,  
ston.  
stante  
those to  
LATES,  
don.  
EW.  
get the  
e iron  
every  
nations  
sual.

# NOBEL'S DYNAMITE

Is the MOST ECONOMICAL and POWERFUL EXPLOSIVE for every kind of MINING and QUARRYING OPERATIONS; for blasting in hard or soft, wet or dry ROCKS; for clearing land of TREE ROOTS and BOULDER STONES; for rending massive BLOCKS of METAL; for SUBAQUEOUS and TORPEDO purposes; and for recovering or clearing away of WRECKS, &c. ITS SAFETY is evidenced by the total ABSENCE OF ACCIDENTS in transit and storage; it is insensible to heavy shocks its GIANT POWER being only fully developed when fired with a powerful percussion detonator, and hence its great safety. As a SUBSTITUTE FOR GUNPOWDER its advantages are the GREAT SAVING OF LABOUR, rapidity and INCREASE OF WORK done, FEWER and smaller BORE-HOLES required, greater depth blasted, safety in use NO DANGER FROM TAMPING, absence of smoke, unaffected by damp, &c.

For information, apply to the—  
NOBEL'S EXPLOSIVES COMPANY (LIMITED), GLASGOW;  
OR AT THE

London & Export Office, 85, GRACECHURCH STREET, LONDON, E.C.

# LITHOFRACTEUR.

THE BEST EXPLOSIVE KNOWN FOR EVERY KIND OF QUARRYING, MINING, TUNNELLING, AND SUBAQUEOUS OPERATIONS, UNRIVALLED FOR STRENGTH, SAFETY, AND FREEDOM FROM GASES. EXPORT ORDERS DELIVERED FREE ON BOARD IN THE THAMES. PAMPHLETS ON APPLICATION. Responsible Agents for the Country Districts can apply to—

KREBS BROTHERS AND CO., Sole Manufacturers and Patentees,  
22, BASINGHALL STREET, LONDON, E.C.

# WET GUN COTTON

Is perfectly unflammable and insensible to the heaviest blows. It can only be fired in a bore-hole by using a special primer and detonator. Its strength is superior, weight for weight, to every known explosive, and it gives off no injurious taste or fumes.

Sold in cartridges ready for use in wet or dry ground at 1s. 6d. per lb.  
PRIMERS AND DETONATORS SOLD SEPARATELY.

For further information apply to—  
THE PATENT SAFETY GUN COTTON COMPANY, LIMITED,  
STOWMARKET,  
SOLE MANUFACTURERS OF ABEL'S GUN COTTON.

LONDON EXPORT OFFICE, 52, QUEEN VICTORIA STREET.

# TONITE, OR COTTON POWDER.

THE SAFEST, STRONGEST, AND CHEAPEST OF ALL EXPLOSIVES.

Recommended to MINERS, PIT SINKERS, QUARRYMEN, and CONTRACTORS as the MOST EFFICIENT and ECONOMICAL BLASTING AGENT ever invented. Results of practical experience show a saving of from 15 to 20 per cent. over the strongest explosives previously in use. It saves labour in drilling holes, as a less number of holes are needed. It does not require thawing, but is ready for use at all temperatures and in all climates. It can also be advantageously used in breaking up boulders, extracting stumps, removing wrecks, exploding torpedos, and for submarine purposes in general, as well as for signal lights and fog signals for ships.

OFFICES:  
23, QUEEN ANNE'S GATE, LONDON, S.W.  
WORKS: FAVERSHAM, KENT.

# THE DARLINGTON ROCK BORER.

No VALVE—BLOW obtained by the movement of the PISTON.  
IN USE IN FRANCE, GERMANY, SPAIN, AND ELSEWHERE.

Rock Borers, Air Compressors, and Electric Blasting Apparatus.  
Sole Agents and Manufacturers for France.—The Blanz  
Mining Company,  
WHERE BORERS MAY BE SEEN IN OPERATION.

For letter of introduction, particulars, &c., apply to—  
JOHN DARLINGTON,  
2, COLEMAN STREET BUILDINGS, MOORGATE STREET, LONDON.

# THE TUCKINGMILL FOUNDRY COMPANY

(TUCKINGMILL FOUNDRY AND ROSEWORTHY HAMMER MILLS),

CAMBORNE, CORNWALL,

Engineers, Iron and Brass Founders, &c.,

MAKERS OF EVERY DESCRIPTION OF

MINING MACHINERY, SHOVELS, GEARWORK,  
PUMPING, WINDING, AND STAMPING ENGINES.

# BLAKE'S STONE BREAKERS.

SOLE MAKERS OF

BORLASE'S PATENT ORE-DRESSING MACHINES AND PULVERISERS.

ESTIMATES GIVEN UPON INDENTS AND SPECIFICATIONS.

ILLUSTRATED CATALOGUES POST FREE ON APPLICATION.

LONDON OFFICE: 85, GRACECHURCH STREET, E.C.

# COAL-CUTTING MACHINERY.

W. and S. FIRTH undertake to CUT, economically, the hardest CANNEL, ANTHRACITE, SHALE, or ORDINARY COAL, ANY DEPTH, UP TO FIVE FEET.

Apply,—  
16, YORK PLACE, LEEDS.

# "Kainotomon" Rock Drill

SELECTED BY THE  
BRITISH, PRUSSIAN, & SAXON  
GOVERNMENTS.

SUPERIOR  
Air-Compressors, Coal-  
Cutters, Pumps, and all  
Mining Machinery.



Secondhand ROCK DRILLS, of  
BRYDON AND DAVIDSON'S  
make £25 each, new £32.

T. A. WARRINGTON,  
30, King-street, Cheapside,  
LONDON E.C.

# THE PHOSPHOR BRONZE COMPANY (LIMITED).



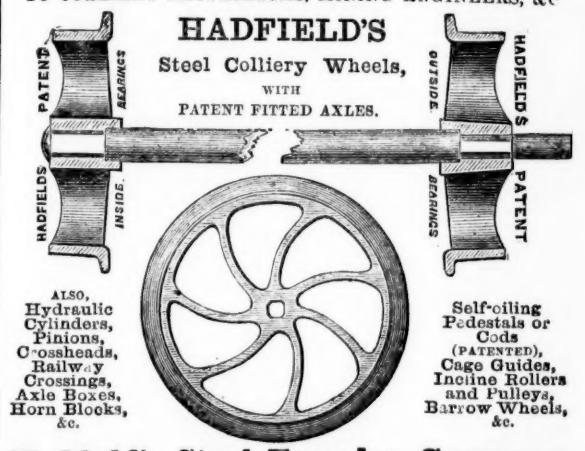
139, CANNON STREET, E.C  
LONDON.

Alloy, No. II., for pinions, ornamental castings, steam fittings, &c.	£120 per ton.
" No. IV., for pinions, pumps, valves, linings, cylinders, &c.	130 "
" No. VI. (must be cast in chill) for bolts, &c.	140 "
" This alloy has very great tensile strength	140 "
" No. VII., for hydraulic pumps, valves, and plungers, piston rings, bushes and bearings, for steel shafts	140 "
" No. XI., special phosphor-bronze bearing metal, wearing five times as long as gun metal	112 "

The prices of castings vary according to the pattern, the quantity required, and the alloy used.

WIRE ROPES, TUBES OF ALL DESCRIPTIONS, &c.

TO COLLIERY PROPRIETORS, MINING ENGINEERS, &c



Hadfield's Steel Foundry Company,  
MANUFACTURERS OF EVERY DESCRIPTION OF  
CRUCIBLE CAST STEEL CASTINGS.  
ATTERCLIFFE, SHEFFIELD.

# INCREASED VALUE OF WATER-POWER.

THE EXTRAORDINARY ADVANCE in the PRICE of COALS has DIRECTED more ATTENTION to WATER POWER, and to the BEST MANNER of APPLYING IT. For many years it has been, to a great extent, neglected and undervalued. One great objection to it has been the variable nature of most streams in these countries, having abundance of water during the winter half-year, and very little in the dry season. No kind of wheel hitherto known was able to give the proper proportion of power from the smaller quantities of water, so that it became the practice very generally to use steam entirely during the summer half of the year, letting the water go to waste. This is now completely prevented, and the full available power can be obtained from a stream at every season by using

# Mac Adam's Variable Turbine.

This wheel (which is now largely in use in England, Scotland, and Ireland) is the only one yet invented which gives proportionate power from both large and small quantities of water. It can be made for using a large winter supply, and yet work with equal efficiency through all variations of quantity down to a fifth, or even less if required. It is easily coupled to a steam-engine, and, in this way always assists it by whatever amount of power the water is capable of giving, and, therefore, saves so much fuel. This Turbine is applicable to all heights of fall. It works immersed in the tail-water, so that no part of the fall is lost, and the motion of the wheel is not affected by floods or back-water.

References to places where it is at work will be given on application to the makers—

MAC ADAM BROTHERS AND CO.,  
ENGINEERS, BELFAST.

MR. W. F. STANLEY, MATHEMATICAL INSTRUMENT MANUFACTURER TO H.M.'S GOVERNMENT, COUNCIL OF INDIA, SCIENCE AND ART DEPARTMENT, ADMIRALTY, &c.  
MATHEMATICAL, DRAWING, and SURVEYING INSTRUMENTS of every description, of the highest quality and finish, at the most moderate prices.  
Price-list post free.

ENGINE DIVIDER TO THE TRADE.  
ADDRESS—GREAT TURNSTILE, HOLBORN, LONDON, W.O.

LA HOUILLE (Weekly Journal) represents the IRON and COAL TRADES of FRANCE. Advertisements referring thereto, and subscriptions, 20s. per annum, post paid, received by the London Agents, EDWARD CASPER and Co., 40, Finsbury Circus, E.C.



## THE MINING SHARE LIST.

## THE MINING JOURNAL.

JUNE 23, 1877

## BRITISH DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
15000	Alderley Edge, c, Cheshire*	10 0 0	—	—	12 11 8	0 0 0	—
15000	Balmby, c, W. Yorks. (4000 to 10,000)	1 0 0	—	—	0 2 0	0 0 0	—
2000	Barnby, c, W. Yorks. (4000 to 10,000)	1 0 0	—	—	0 2 0	0 0 0	—
2000	Barnby, c, W. Yorks. (4000 to 10,000)	1 0 0	—	—	0 2 0	0 0 0	—
2000	Barnby, c, W. Yorks. (4000 to 10,000)	1 0 0	—	—	0 2 0	0 0 0	—
2000	Barnby, c, W. Yorks. (4000 to 10,000)	1 0 0	—	—	0 2 0	0 0 0	—
2000	Barnby, c, W. Yorks. (4000 to 10,000)	1 0 0	—	—	0 2 0	0 0 0	—
2000	Barnby, c, W. Yorks. (4000 to 10,000)	1 0 0	—	—	0 2 0	0 0 0	—
2000	Barnby, c, W. Yorks. (4000 to 10,000)	1 0 0	—	—	0 2 0	0 0 0	—
2000	Barnby, c, W. Yorks. (4000 to 10,000)	1 0 0	—	—	0 2 0	0 0 0	—
2000	Barnby, c, W. Yorks. (4000 to 10,000)	1 0 0	—	—	0 2 0	0 0 0	—

## FOREIGN DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
15000	Alamos, c, Spain*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Alamos, c, Spain*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Alamos, c, Spain*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Alamos, c, Spain*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Alamos, c, Spain*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Alamos, c, Spain*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Alamos, c, Spain*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Alamos, c, Spain*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Alamos, c, Spain*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Alamos, c, Spain*	2 0 0	—	—	1 17 3	0 0 0	—

## NON-DIVIDEND FOREIGN MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
15000	Anglo-Australian, c, Victoria*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-Australian, c, Victoria*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-Australian, c, Victoria*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-Australian, c, Victoria*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-Australian, c, Victoria*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-Australian, c, Victoria*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-Australian, c, Victoria*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-Australian, c, Victoria*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-Australian, c, Victoria*	2 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-Australian, c, Victoria*	2 0 0	—	—	1 17 3	0 0 0	—

## NON-DIVIDEND MINES.

Shares.	Mines.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
15000	Aberdeen, c, Scotland*	1 0 0	—	—	1 17 3	0 0 0	—
15000	Aberdeen, c, Scotland*	1 0 0	—	—	1 17 3	0 0 0	—
15000	Aberdeen, c, Scotland*	1 0 0	—	—	1 17 3	0 0 0	—
15000	Aberdeen, c, Scotland*	1 0 0	—	—	1 17 3	0 0 0	—
15000	Aberdeen, c, Scotland*	1 0 0	—	—	1 17 3	0 0 0	—
15000	Aberdeen, c, Scotland*	1 0 0	—	—	1 17 3	0 0 0	—
15000	Aberdeen, c, Scotland*	1 0 0	—	—	1 17 3	0 0 0	—
15000	Aberdeen, c, Scotland*	1 0 0	—	—	1 17 3	0 0 0	—
15000	Aberdeen, c, Scotland*	1 0 0	—	—	1 17 3	0 0 0	—
15000	Aberdeen, c, Scotland*	1 0 0	—	—	1 17 3	0 0 0	—

## IRON AND COAL COMPANIES.

Shares.	Company.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
15000	Abbot, John, and Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Abbot, John, and Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Abbot, John, and Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Abbot, John, and Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Abbot, John, and Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Abbot, John, and Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Abbot, John, and Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Abbot, John, and Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Abbot, John, and Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Abbot, John, and Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—

## WAGON COMPANIES.

Shares.	Company.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
15000	Birmingham Wagon Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Birmingham Wagon Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Birmingham Wagon Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Birmingham Wagon Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Birmingham Wagon Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Birmingham Wagon Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Birmingham Wagon Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Birmingham Wagon Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Birmingham Wagon Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—
15000	Birmingham Wagon Co. (L.)	1 0 0	—	—	1 17 3	0 0 0	—

## TELEGRAPH COMPANIES.

Shares.	Company.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
15000	Anglo-American	1 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-American	1 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-American	1 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-American	1 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-American	1 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-American	1 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-American	1 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-American	1 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-American	1 0 0	—	—	1 17 3	0 0 0	—
15000	Anglo-American	1 0 0	—	—	1 17 3	0 0 0	—

## MISCELLANEOUS.

Shares.	Company.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
15000	Atlantic and Great Western Leased	1 0 0	—	—	1 17 3	0 0 0	—
15000	Atlantic and Great Western Leased	1 0 0	—	—	1 17 3	0 0 0	—
15000	Atlantic and Great Western Leased	1 0 0	—	—	1 17 3	0 0 0	—
15000	Atlantic and Great Western Leased	1 0 0	—	—	1 17 3	0 0 0	—
15000	Atlantic and Great Western Leased	1 0 0	—	—	1 17 3	0 0 0	—
15000	Atlantic and Great Western Leased	1 0 0	—	—	1 17 3	0 0 0	—
15000	Atlantic and Great Western Leased	1 0 0	—	—	1 17 3	0 0 0	—
15000	Atlantic and Great Western Leased	1 0 0	—	—	1 17 3	0 0 0	—
15000	Atlantic and Great Western Leased	1 0 0	—	—	1 17 3	0 0 0	—
15000	Atlantic and Great Western Leased	1 0 0	—	—	1 17 3	0 0 0	—

## FOREIGN AND MISCELLANEOUS STOCKS, BONDS, LOANS, AND TRUSTS.

Shares.	Company.	Paid.	Last wk.	Clos. pr.	Total divs.	Per sh.	Last pd.
15000	Argentine, 1858, 6 per cent.	1 0 0	—	—	1 17 3	0 0 0	—
15000	Argentine, 1858, 6 per cent.	1 0 0	—	—	1 17 3	0 0 0	—
15000	Argentine, 1858, 6 per cent.	1 0 0	—	—	1 17 3	0 0 0	—
15000	Argentine, 1858, 6 per cent.	1 0 0	—	—	1 17 3	0 0 0	—
15000	Argentine, 1858, 6 per cent.	1 0 0	—	—	1 17 3	0 0 0	—
15000	Argentine, 1858, 6 per cent.	1 0 0	—	—	1 17 3	0 0 0	—
15000	Argentine, 1858, 6 per cent.	1 0 0	—	—	1 17 3	0 0 0	—
15000	Argentine, 1858, 6 per cent.	1 0 0	—	—	1 17 3	0 0 0	—
15000	Argentine, 1858, 6 per cent.	1 0 0	—	—	1 17 3	0 0 0	—
15000	Argentine, 1858, 6 per cent.	1 0 0	—	—	1 17 3	0 0 0	—

• Limited Liability Companies; † quoted on the Stock Exchange; ‡ have paid dividends.

London: Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 25, FLEET STREET, E.C., where all communications are requested to be addressed.—June 23, 1877.